STEVEN L. BRUNTON

James B. Morrison Professor

Mechanical Engineering
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RESEARCH INTERESTS

- Machine learning and data science for modeling and control of complex systems
- Fluid dynamics, flow control, transport phenomena, and turbulence modeling
- Model reduction, sparse sensing, and feedback control of high-dimensional dynamical systems
- Adaptive and robust control techniques for energy optimization and conversion

AFFILIATIONS

University of Washington (UW)   **Seattle, WA 98195**

2021 – present	Professor of Mechanical Engineering
2019 – present	Adjunct Professor of Computer Science
2018 – present	Adjunct Professor of Applied Mathematics
2018 – present	Associate Professor of Mechanical Engineering
2014 – present	Data Science Fellow, eScience Institute
2014 – 2018	Assistant Professor of Mechanical Engineering
2012 – 2014	Acting Assistant Professor of Applied Mathematics

APPOINTMENTS

California Institute of Technology (sabbatical)	**Aug. 2021–June 2022**
Institute for Pure & Applied Mathematics (IPAM)	**Sept.–Dec. 2019**

EDUCATION

Princeton University   **Princeton, NJ 08544**
Ph.D. in Mechanical and Aerospace Engineering, 2012   Advisor: Clarence W. Rowley
Thesis: Unsteady aerodynamic models for agile flight at low Reynolds numbers.
California Institute of Technology   **Pasadena, CA 91125**
B.S. Mathematics, Minor Control and Dynamical Systems, 2006   Advisor: Jerrold E. Marsden
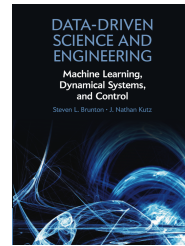Thesis: Rank-1 saddle transport in three or more degrees of freedom scattering reactions.
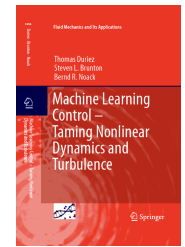
AWARDS & HONORS

- Moore Distinguished Scholar, Sabbatical at Caltech [2021-2022]
- Presidential Early Career Award for Scientists and Engineers (PECASE) [2019]
- Simons Participant, Institute for Pure and Applied Mathematics (IPAM) UCLA [2019]
- SIAM Computational Science and Engineering Early Career Prize [2019]
- UW College of Engineering Junior Faculty Award [2018]
- Air Force Young Investigator Program Award [2017]
- Army Young Investigator Program Award [2017]
- UW College of Engineering Faculty Teaching Award [2017]
- Data Science Fellow, eScience Institute [2014]
- Athena-Feron Award for Mathematical Excellence [2007]
- Princeton MAE Second Year Graduate Fellowship [2007]
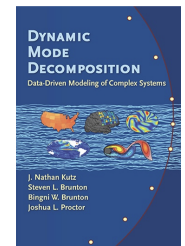- Gordon Wu Graduate Fellowship [2006-2010]

Books

3. **S. L. Brunton**, and J. N. Kutz
   Data Driven Science and Engineering:
   Machine Learning, Dynamical Systems, and Control
   Cambridge 2019. databookuw.com

2. T. Duriez, **S. L. Brunton**, and B. R. Noack
   Machine Learning Control –
   Taming Nonlinear Dynamics and Turbulence
   Springer 2016.

1. J. N. Kutz, **S. L. Brunton**, B. W. Brunton, and J. L. Proctor
   Dynamic Mode Decomposition: Data-Driven Modeling of Complex Systems
   SIAM 2016.

Journal Publications

13000 Google scholar citations; h-index 48; i10-index 114

127. **S. L. Brunton**, M. Budišić, E. Kaiser, and J. N. Kutz
     Modern Koopman Theory for Dynamical Systems.
     To appear in SIAM Review, 2021.

126. **S. L. Brunton**
     Applying Machine Learning to Study Fluid Mechanics.
     To appear in Acta Mechanica Sinica, 2021.

125. C. Gong, **S. L. Brunton**, B. T. Schowengerdt, E. J. Seibel
     Intensity-Mosaic: Automatic Panorama Mosaicking of Disordered Images with Insufficient Features.
     To appear in Journal of Medical Imaging, 2021.

124. S. M. Hirsch, S. M. Ichinaga, **S. L. Brunton**, J. N. Kutz, and B. W. Brunton
     Structured Time-Delay Models for Dynamical Systems with Connections to Frenet-Serret Frame.
     To appear in Proceedings of the Royal Society A, 2021.

123. S. T. M. Dawson and **S. L. Brunton**
     Improved approximations to the Wagner function using sparse identification of nonlinear dynamics.
     To appear in AIAA Journal, 2021.

122. A. G. Nair, K. Taira, B. W. Brunton and **S. L. Brunton**
     Phase-based control of periodic flows.
     To appear in Journal of Fluid Mechanics, 2021.

121. B. M. de Silva, J. Callaham, J. Jonker, NN. Goebel, J. Klemisch, D. McDonald, N. Hicks, J. N. Kutz, **S. L. Brunton**, and A. Y. Aravkin
Physics-informed machine learning for sensor fault detection with flight test data.
To appear in AIAA Journal, 2021.

120. K. Manohar, J. N. Kutz, and **S. L. Brunton**.
Optimal sensor and actuator placement using balanced model reduction.
To appear in IEEE Transactions on Automatic Control, 2021.

119. J. J. Bramburger, **S. L. Brunton**, and J. N. Kutz
Deep learning of conjugate mappings.
Physica D, **427**:133008, 2021.

118. A. A. Kaptanoglu, J. L. Callaham, C. J. Hansen, A. Aravkin, and **S. L. Brunton**
Promoting global stability in data-driven models of quadratic nonlinear dynamics.
Physical Review Fluids, **6**:094401, 2021. (Editors' Suggestion)

117. J. Snyder, J. Callaham, **S. L. Brunton**, and J. N Kutz
Data-driven stochastic modeling of coarse-grained dynamics with finite-size effects using Langevin regression.
Physica D, **427**:133004, 2021.

116. N. J. Linden, D. R. Tabuena, N. A. Steinmetz, W. J. Moody, **S. L. Brunton**, and B. W. Brunton
Go with the FLOW: Visualizing spatiotemporal dynamics in optical widefield calcium imaging.
Journal of the Royal Society Interface, **18**(181), 2021.

115. Y. Guan, **S. L. Brunton**, and I. Novosselov
Sparse nonlinear models of chaotic electroconvection.
Royal Society Open Science, **8**(8):202367, 2021.

114. **S. L. Brunton**, J. N. Kutz, K. Manohar, A. Y. Aravkin, K. Morgansen, J. Klemisch, N. Goebel, J. Buttrick, J. Poskin, A. Blom-Schieber, T. Hogan, and D. McDonald
Data-driven aerospace engineering: Reframing the industry with machine learning.
AIAA Journal, **59**(8):2820–2847, 2021.

113. A. A. Kaptanoglu, K. D. Morgan, C. J. Hansen, and **S. L. Brunton**
Physics-constrained, low-dimensional models for MHD: First-principles and data-driven approaches.
Physical Review E, **104**(1):015206, 2021.

112. D. E. Shea, **S. L. Brunton**, and J. N. Kutz
SINDy-BVP: Sparse Identification of Nonlinear Dynamics for Boundary Value Problems.
Physical Review Research, **3**(2):023255-1–023255-14, 2021.

111. D. E. Shea, R. Giridharagopal, D. S. Ginger, **S. L. Brunton**, and J. N. Kutz
Extraction of instantaneous frequencies and amplitudes in nonstationary time-series data.
IEEE Access, **9**:82453–83466, 2021.

110. J. L. Callaham, J.-Ch. Loiseau, G. Rigas, and **S. L. Brunton**
Nonlinear stochastic modeling with Langevin regression.
Proceedings of the Royal Society A, **477**(2250), 2021.

109. E. Kaiser, J. N. Kutz, and **S. L. Brunton**
Data-driven discovery of Koopman eigenfunctions for control.
Machine Learning Science and Technology, **2**:035023, 2021.

108. A. Mendible, J. Koch, H. Lange, **S. L. Brunton**, and J. N. Kutz
Data-driven modeling of rotating detonation waves.
Physical Review Fluids, **6**:050507, 2021.

107. B. Herrmann, P. J. Baddoo, R. Semaan, **S. L. Brunton**, and B. J. McKeon
Data-driven resolvent analysis.
Journal of Fluid Mechanics, **918**(A10), 2021.

106. A. Goldschmidt, E. Kaiser, J. Dubois, **S. L. Brunton**, and J. N. Kutz
Bilinear dynamic mode decomposition for quantum control.
New Journal of Physics, **23**(3):033035, 2021.

105. J. J. Bramburger, J. N. Kutz, and **S. L. Brunton**
Data-Driven Stabilization of Periodic Orbits.
IEEE Access, **8**:43504–43521, 2021.

104. B. M. de Silva, K. Manohar, E. Clark, B. W. Brunton, **S. L. Brunton**, J. N. Kutz
PySensors: A Python Package for Sparse Sensor Placement.
Journal of Open Source Software, **6**(58):2828, 2021.

103. M. V. Zhelyeznyakov, **S. L. Brunton**, and A. Majumdar
Deep learning to accelerate Maxwell's equations for inverse design of dialectric metasurfaces.
ACS Photonics, **8**(2):481–488, 2021.

102. J. L. Callaham, J. N. Kutz, B. W. Brunton and **S. L. Brunton**
Learning dominant physical processes with data-driven balance models.
Nature Communications, **12**(1):1–10, 2021.

101. H. Lange, **S. L. Brunton**, and J. N. Kutz
From Fourier to Koopman: Spectral Methods for Long-term Time Series Prediction.
Journal of Machine Learning Research, **22**(41):1–38, 2021.

100. E. Clark, A. Vincent, J. N. Kutz, and **S. L. Brunton**
Bracketing brackets with bras and kets.
Journal of Manufacturing Systems, **58**(A):384–391, 2021.

99. I. Scherl, B. Strom, **S. L. Brunton**, and B. L. Polagye
Geometric and control optimization of a two cross-flow turbine array.
Journal of Renewable and Sustainable Energy, **12**:064501, 2020.

98. E. Clark, **S. L. Brunton**, and J. N. Kutz
Multi-fidelity sensor selection: Greedy algorithms to place cheap and expensive sensors with cost constraints.
IEEE Sensors, **21**(1):600–611, 2020.

97. C. Sun, E. Kaiser, **S. L. Brunton**, and J. N. Kutz
Deep reinforcement learning for optical systems: A case study of mode-locked lasers.
Machine Learning: Science and Technology, **1**(4):045013, 2020.

96. C. Gin, B. Lusch, **S. L. Brunton**, and J. N. Kutz
Deep learning models for global coordinate transformations that linearize PDEs.
European Journal of Applied Mathematics, **32**(3):515–539, 2020.

95. B. Herrmann, P. Oswald, R. Semaan and **S. L. Brunton**
Modeling synchronization in forced turbulent oscillator flows.
Communications Physics, **3**(195), 2020.

94. K. Kaheman, J. N. Kutz, and **S. L. Brunton**
SINDy-PI: A Robust Algorithm for Parallel Implicit Sparse Identification of Nonlinear Dynamics.
Proceedings of the Royal Society A, **476**(2242), 2020.

93. A. G. Nair, B. Strom, B. W. Brunton and **S. L. Brunton**
Phase-consistent dynamic mode decomposition from multiple overlapping spatial domains.

Physical Review Fluids, **5**:074702, 2020.

92. K. Champion, P. Zheng, A. Y. Aravkin, **S. L. Brunton**, and J. N. Kutz.
A unified sparse optimization framework to learn parsimonious physics-informed models from data.
IEEE Access, **8**:169259-169271, 2020.

91. E. Clark, J. N. Kutz, and **S. L. Brunton**
Sensor Selection with Cost Constraints for Dynamically Relevant Bases.
IEEE Sensors, **20**(19):11674–11687, 2020.

90. N. Fonzi, **S. L. Brunton**, and U. Fasel
Data-driven nonlinear aeroelastic models of morphing wings for control.
Proceedings of the Royal Society A, **476**(2239), 2020.

89. **S. L. Brunton**, Maziar S. Hemati, and K. Taira
Special issue on machine learning and data-driven methods in fluid dynamics.
Theoretical and Computational Fluid Dynamics, **34**(4):333–337, 2020.

88. A. Mendible, **S. L. Brunton**, A. Aravkin, W. Lowrie, and J. N. Kutz
Dimensionality reduction and reduced order modeling for traveling wave physics.
Theoretical and Computational Fluid Dynamics, **34**(4):385–400, 2020.

87. K. Bieker, S. Peitz, **S. L. Brunton**, J. N. Kutz, and M. Dellnitz.
Deep Model Predictive Control with Online Learning for Complex Physical Systems.
Theoretical and Computational Fluid Dynamics, **34**(4):577–591, 2020.

86. N. B. Erichson, L. Mathelin, Y. Zhewei, **S. L. Brunton**, M. Mahoney, and J. N. Kutz.
Shallow Learning for Fluid Flow Reconstruction with Limited Sensors and Limited Data.
Proceedings of the Royal Society A, **476**(2238), 2020.

85. M. Kamb, E. Kaiser, **S. L. Brunton**, and J. N. Kutz.
Time-Delay Observables for Koopman: Theory and Applications.
SIAM Journal on Dynamical Systems, **19**(2):886–917, 2020.

84. N. B. Erichson, K. Manohar, **S. L. Brunton**, and J. N. Kutz
Randomized CP Tensor Decomposition.
Machine Learning: Science and Technology, **1**(2):025012, 2020.

83. I. Scherl, B. Strom, J. K. Shang, O. Williams, B. L. Polagye, and **S. L. Brunton**.
Robust Principal Component Analysis for Particle Image Velocimetry.
Physical Review Fluids, **5**:054401, 2020. (Editors' Suggestion)

82. T. L. Mohren, T. L. Daniel, and **S. L. Brunton**
Learning precisely timed feedforward control of the sensor-denied inverted pendulum.
IEEE Control System Letters, **4**(3):731–736, 2020.

81. N. B. Erichson, P. Zeng, K. Manohar, **S. L. Brunton**, J. N. Kutz, and A. Y. Aravkin.
Sparse principal component analysis via variable projection.
SIAM Journal on Applied Mathematics, **80**(2):977–1002, 2020.

80. B. de Silva, K. Champion, M. Quade, J.-Ch. Loiseau, J. N. Kutz, and **S. L. Brunton**
PySINDy: A Python Package for the Sparse Identification of Dynamics from Data.
Journal of Open Source Software, **5**(49): 2104, 2020.

79. B. de Silva, D. M. Higdon, **S. L. Brunton**, and J. N. Kutz.
Discovery of physics from data: Universal laws and discrepancy models.
Frontiers in Artificial Intelligence, **3**:1–25, 2020.

78. K. Taira, M. S. Hemati, **S. L. Brunton**, Y. Sun, K. Duraisamy, S. Bagheri, S. T. M. Dawson,

and C.-A. Yeh.
Modal Analysis of Fluid Flows: Applications and Outlook.
AIAA Journal, **58**(3):1–25, 2020.

77. A. A. Kaptanoglu, K. D. Morgan, C. J. Hansen, and **S. L. Brunton**
    Characterizing magnetic plasmas with dynamic mode decomposition.
    Physics of Plasmas, **27**:032108, 2020.

76. Z. Bai, E. Kaiser, J. L. Proctor, B. W. Brunton, J. N. Kutz, and **S. L. Brunton**
    Dynamic mode decomposition for compressive system identification
    AIAA Journal, **58**(2):561–574, 2020.

75. **S. L. Brunton**, B. R. Noack, and P. Koumoutsakos.
    Machine Learning for Fluid Mechanics.
    Annual Review of Fluid Mechanics, **52**:477–508, 2020.

74. Z. Bai, N. B. Erichson, M. Gopalakrishnan Meena, K. Taira, and **S. L. Brunton**
    Randomized methods to characterize large-scale vortical flow networks.
    PLoS ONE, **14**(11):e0225265, 2019.

73. K. Champion, B. Lusch, J. N. Kutz, and **S. L. Brunton**.
    Data-driven discovery of coordinates and governing equations.
    Proceedings of the National Academy of Sciences, **116**(45):22445–22451, 2019.

72. J. L. Callaham, K. Maeda, and **S. L. Brunton**.
    Robust flow reconstruction from limited measurements via sparse representation.
    Physical Review Fluids, **4**:103907, 2019.

71. N. B. Erichson, L. Mathelin, J. N. Kutz, and **S. L. Brunton**.
    Randomized dynamic mode decomposition.
    SIAM Journal on Applied Dynamical Systems, **18**(4):1867–1891, 2019.

70. S. Li, E. Kaiser, S. Laima, H. Li, **S. L. Brunton**, and J. N. Kutz.
    Discovering time-varying aeroelastic models of a long-span suspension bridge from field measurements by sparse identification of nonlinear dynamical systems.
    Physical Review E, **100**(2):022220, 2019.

69. S. H. Rudy, **S. L. Brunton**, and J. N. Kutz.
    Smoothing and parameter estimation by soft-adherence to governing equations.
    Journal of Computational Physics, **398**:108860, 2019.

68. S. H. Rudy, J. N. Kutz, and **S. L. Brunton**.
    Deep learning of dynamics and signal–noise decomposition with time-stepping constraints.
    Journal of Computational Physics, **396**:483–506, 2019.

67. C. Gong, N. B. Erichson, J. P. Kelly, L. Trutoiu, B. T. Schowengerdt, **S. L. Brunton**, and E. J. Seibel.
    RetinaMatch: Efficient Template Matching of Retina Images for Teleopthamology.
    IEEE Transactions on Medical Imaging, **38**(8):1993–2004, 2019.

66. A. Nair, C.-A. Yeh, E. Kaiser, B. Noack, **S. L. Brunton**, and K. Taira.
    Cluster-based feedback control of turbulent post-stall separated flows.
    Journal of Fluid Mechanics, **875**:345–375, 2019.

65. **S. L. Brunton** and J. N. Kutz.
    Data-driven model discovery for materials.
    Journal of Physics: Materials, **2**:044002, 2019.

64. N. B. Erichson, S. Voronin, **S. L. Brunton**, and J. N. Kutz

Randomized Matrix Decompositions using R.
Journal of Statistical Software, **89**(11):1–48, 2019.

63. S. Rudy, A. Alla, **S. L. Brunton**, and J. N. Kutz.
Data-driven identification of parametric partial differential equations.
SIAM Journal on Applied Dynamical Systems, **18**(2):643–660, 2019.

62. E. Clark, T. Askham, **S. L. Brunton**, and J. N. Kutz.
Greedy sensor placement with cost constraints.
IEEE Sensors Journal, **19**(7):2642–2656, 2019.

61. N. M. Mangan, T. Askham, **S. L. Brunton**, J. N. Kutz, and J. L. Proctor.
Model selection for hybrid dynamical systems via sparse regression.
Proceedings of the Royal Society A, **475**(20180534), 2019.

60. K. P. Champion, **S. L. Brunton**, and J. N. Kutz.
Discovery of nonlinear multiscale systems: Sampling strategies and embeddings.
SIAM Journal on Applied Dynamical Systems, **18**(1):312–333, 2019.

59. K. Manohar, E. Kaiser, **S. L. Brunton**, and J. N. Kutz
Optimized sampling for multiscale dynamics.
SIAM Multiscale Modeling and Simulation, **17**(1):117–136, 2019.

58. P. Zheng, T. Askham, **S. L. Brunton**, J. N. Kutz, and A. Y. Aravkin.
A Unified Framework for Sparse Relaxed Regularized Regression: SR3.
IEEE Access, **7**(1):1404–1423, 2019.

57. S. Gupta, P. Malte, **S. L. Brunton**, and I. Novosselov.
Prevention of Lean Flame Blowout Using a Predictive Chemical Reactor Network Control.
Fuel, **236**:583–588, 2019.

56. Y. Hu, **S. L. Brunton**, N. Cain, S. Mihalas, J. N. Kutz, and E. Shea-Brown
Feedback through graph motifs relates structure and function in complex networks.
Physical Review E, **98**:062312, 2018.

55. B. Lusch, J. N. Kutz, and **S. L. Brunton**.
Deep learning for universal linear embeddings of nonlinear dynamics.
Nature Communications, **9**(1):4950, 2018.

54. E. Kaiser, J. N. Kutz, and **S. L. Brunton**
Sparse identification of nonlinear dynamics for model predictive control in the low-data limit.
Proceedings of the Royal Society A, **474**(2219), 2018.

53. J. N. Kutz, **S. L. Brunton**, and J. L. Proctor
Koopman theory for partial differential equations.
Complexity, **2018**, 6010634, 2018.

52. M. Au-Yeung, P.G. Reinhall, G. Bardy, and **S. L. Brunton**
Development and validation of warning system of ventricular tachyarrhythmia in patients with
heart failure with heart rate variability data.
PLoS ONE, **13**(11):e0207215, 2018.

51. T. Mohren, T. L. Daniel, **S. L. Brunton**, and B. W. Brunton.
Neural-inspired sensors enable sparse, efficient classification of spatiotemporal data.
Proceedings of the National Academy of Sciences, **115**(42):10564–10569, 2018.

50. K. Manohar, T. Hogan, J. Buttrick, A. G. Banerjee, J. N. Kutz, and **S. L. Brunton**
Predicting shim gaps in aircraft assembly with machine learning and sparse sensing.
Journal of Manufacturing Systems, **48**(Part C):87–95, 2018.

49. B. Strom, **S. L. Brunton**, and B. Polagye
Advanced control methods for cross-flow turbines.
International Marine Energy Journal, **1**(2):129–138, 2018.

48. M. Quade, M. Abel, J. N. Kutz, and **S. L. Brunton**.
Sparse identification of nonlinear dynamics for rapid model recovery.
Chaos, **28**(6):063116-1–063116-10, 2018.

47. A. G. Nair, **S. L. Brunton**, and K. Taira
Networked oscillator based modeling and control of unsteady fluid flows.
Physical Review E., **97**(6):063107-1–063107-14, 2018.

46. W. Guo, K. Manohar, **S. L. Brunton**, and A. G. Banerjee
Sparse-TDA: Sparse realization of topological data analysis for multi-way classification.
IEEE Transactions on Knowledge and Data Engineering, **30**(7):1403–1408, 2018.

45. K Manohar, B. W. Brunton, J. N. Kutz, and **S. L. Brunton**
Data-Driven Sparse Sensor Placement.
IEEE Control Systems Magazine, **38**(3):63–86, 2018 (invited).

44. J. C. Loiseau, B. R. Noack, and **S. L. Brunton**
Sparse reduced-order modeling: Sensor-based dynamics to full-state estimation.
Journal of Fluid Mechanics, **844**:459–490, 2018.

43. J. L. Proctor, **S. L. Brunton**, and J. N. Kutz
Generalizing Koopman theory to allow for inputs and control.
SIAM Journal of Dynamical Systems, **17**(1):909–930, 2018.

42. S. Sargsyan, **S. L. Brunton**, and J. N. Kutz
Online interpolation point refinement for reduced order models using a genetic algorithm.
SIAM Journal on Scientific Computing, **40**(1):B283–B304, 2018.

41. T. Baumeister, **S. L. Brunton**, and J. N. Kutz
Deep learning and model predictive control for self-tuning mode-locked lasers.
J. Optical Society of America B, **35**(3): 617–626, 2018.

40. J. C. Loiseau and **S. L. Brunton**
Constrained sparse Galerkin regression.
Journal of Fluid Mechanics, **838**:42–67, 2018.

39. E. Kaiser, M. Morzynski, G. Daviller, J. N. Kutz, B. Brunton, and **S. L. Brunton**
Sparsity enabled cluster reduced-order modeling for control.
Journal of Computational Physics, **352**:388–409, 2018.

38. K. Taira, **S. L. Brunton**, S. T. M. Dawson, C. W. Rowley, T. Colonius, B. J. McKeon, O.
Schmidt, S. Gordeyev, V. Theofilis, and L. S. Ukeiley
Modal Analysis of Fluid Flows: An Overview.
AIAA Journal, **55**(12):4013–4041, 2017.

37. N. M. Mangan, J. N. Kutz, **S. L. Brunton**, and J. L. Proctor
Model selection for dynamical systems via sparse regression and information criteria.
Proceedings of the Royal Society A, **473**: 1–16, 2017

36. B. Strom, **S. L. Brunton**, and B. Polagye
Intracycle angular velocity control of cross-flow turbines.
Nature Energy, **2**(17103):1–9, 2017.

35. **S. L. Brunton**, B. W. Brunton, J. L. Proctor, E. Kaiser, and J. N. Kutz
Chaos as an intermittently forced linear system.

Nature Communications, **8**(19):1–9, 2017.

34. S. H. Rudy, **S. L. Brunton**, J. L. Proctor, and J. N. Kutz
Data-driven discovery of partial differential equations.
Science Advances, **3**:e1602614, 2017.

33. **S. L. Brunton**, J. N. Kutz, and J. L. Proctor
Data-driven discovery of governing physical laws.
SIAM News, **50**(1), 2017.

32. K. Manohar, **S. L. Brunton**, and J. N. Kutz
Environment identification in flight using sparse approximation of wing strain.
Journal of Fluids and Structures, **70**:162–180, 2017.

31. J. M. Kunert, J. L. Proctor, **S. L. Brunton**, and J. N. Kutz
Spatiotemporal feedback and network structure drive and encode *Caenorhabditis elegans* locomotion.
PLoS Computational Biology, **13**(1):e1005303, 2017.

30. N. M. Mangan, **S. L. Brunton**, J. L. Proctor, and J. N. Kutz
Inferring biological networks by sparse identification of nonlinear dynamics.
IEEE Transactions on Molecular, Biological, and Multi-Scale Communications, Special Issue on Biological Applications of Information Theory in Honor of Claude Shannon's Centennial – Part 1, **2**(1):52–63, 2016.

29. N. B. Erichson, **S. L. Brunton**, and J. N. Kutz
Compressed Dynamic Mode Decomposition for Real-Time Object Detection.
Journal of Real-Time Image Processing, **16**(5):1479–1492, 2019. (accepted 2016)

28. B. W. Brunton, **S. L. Brunton**, J. L. Proctor, and J. N. Kutz.
Sparse sensor placement optimization for classification.
SIAM Journal on Applied Mathematics, **76**(5):2099–2122, 2016.

27. J. L. Proctor, **S. L. Brunton**, and J. N. Kutz
Including inputs and control within equation-free architectures for complex systems. (invited review)
European Physical Journal Special Topics, **225**:2413–2434, 2016.

26. V. Parezanovic, L. Cordier, T. Duriez, A. Spohn, B. R. Noack, J.-P. Bonnet, M. Segond, M. Abel, and **S. L. Brunton**
Frequency selection by feedback control in a turbulent shear-flow.
Journal of Fluid Mechanics, **797**:247–283, 2016.

25. **S. L. Brunton**, J. L. Proctor, and J. N. Kutz.
Discovering governing equations from data: Sparse identification of nonlinear dynamical systems.
Proceedings of the National Academy of Sciences, **113**(15):3932-3937, 2016.

24. K. Taira, A. G. Nair, and **S. L. Brunton**
Network Structure of Two-Dimensional Isotropic Turbulence.
Journal of Fluid Mechanics, **795**(R2):1–11, 2016.

23. S. Madhavan, **S. L. Brunton**, and J. J. Riley
Finite-time Lyapunov exponents for inertial particles in an unsteady fluid.
Physical Review E, **93**:033108, 2016.

22. **S. L. Brunton**, B. W. Brunton, J. L. Proctor, and J. N. Kutz.
Koopman invariant subspaces and finite linear representations of nonlinear dynamical systems for control.
PLoS ONE, **11**(2):e0150171, 2016.

21. J. N. Kutz, X. Fu, and **S. L. Brunton**.
Multi-resolution dynamic mode decomposition.
SIAM Journal of Applied Dynamical Systems, **15**(2):713–735, 2016.

20. J. L. Proctor, **S. L. Brunton**, and J. N. Kutz.
Dynamic mode decomposition with control.
SIAM Journal of Applied Dynamical Systems, **15**(1):142–161, 2016.

19. M. C. Johnson, **S. L. Brunton**, N. B. Kundtz, and J. N. Kutz.
Extremum-seeking control of the beam pattern of a reconfigurable holographic metamaterial antenna.
Journal of the Optical Society of America, A, **33**(1):59–68, 2016.

18. **S. L. Brunton**, J. L. Proctor, and J. N. Kutz.
Compressive sampling and dynamic mode decomposition.
Journal of Computational Dynamics, **2**(2):165–191, 2015.

17. J. N. Kutz and **S. L. Brunton**.
Intelligent systems for stabilizing mode-locked lasers and frequency combs: Machine learning and equation-free control paradigms for self-tuning optics.
Nanophotonics, **4**:459–471, 2015.

16. S. Sargsyan, **S. L. Brunton**, and J. N. Kutz
Nonlinear model reduction for complex systems using sparse optimal sensor locations from learned nonlinear libraries.
Physical Review E, **92**(3):033304-1–033304-13, 2015.

15. **S. L. Brunton**, and B. R. Noack
Closed-loop turbulence control: Progress and challenges.
Applied Mechanics Reviews, **67**(5):050801-1–050801-48, 2015.

14. M. C. Johnson, **S. L. Brunton**, J. N. Kutz, and N. B. Kundtz.
Sidelobe canceling for optimization of reconfigurable holographic metamaterial antenna.
IEEE Transactions on Antennas and Propagation, **63**(4):1881–1886, 2015.

13. V. Parezanovic, J. C. Laurentie, J. Delville, L. Cordier, C. Fourment, A. Spohn, B. R. Noack, J.-P. Bonnet, T. Shaqarin, M. Segond, M. Abel, and **S. L. Brunton**.
Mixing layer manipulation experiment: From open-loop forcing to closed-loop machine learning turbulence control.
The Journal of Flow, Turbulence and Combustion, **94**(1):155–173, 2015.

12. **S. L. Brunton**, J. H . Tu, I. Bright, and J. N. Kutz.
Compressive sensing and low-rank libraries for classification of bifurcation regimes in nonlinear dynamical systems. arXiv:1312.4221 [math.DS]
SIAM Journal of Applied Dynamical Systems, **13**(4):1716–1732, 2014

11. J. L. Proctor, **S. L. Brunton**, B. W. Brunton, and J. N. Kutz.
Exploiting sparsity and equation-free architectures in complex systems.
The European Physical Journal Special Topics (EPJ-ST), **223**: 2665–2684, 2014. (invited review)

10. J. H. Tu, C. W. Rowley, D. M. Luchtenburg, **S. L. Brunton**, and J. N. Kutz.
Generalizing dynamic mode decomposition to a larger class of datasets. arXiv:1312.0041 [math.NA]
Journal of Computational Dynamics, **1**(2):391–421, 2014.

9. D. M. Luchtenburg, **S. L. Brunton**, and C. W. Rowley.
Long-time uncertainty propagation using generalized polynomial chaos and flow map composition.
Journal of Computational Physics, **274**: 783–802, 2014.

8. **S. L. Brunton**, S. T. M. Dawson, and C. W. Rowley.

State-space identification of reduced-order unsteady aerodynamic models for feedback control.
Journal of Fluids and Structures, **50**:253–270, 2014.

7. **S. L. Brunton**, X. Fu, and J. N. Kutz.
Self-tuning fiber lasers.
IEEE Journal of Special Topics in Quantum Electronics, **20**(5), 2014.

6. X. Fu, **S. L. Brunton**, and J. N. Kutz.
Classification of birefringence in mode-locked fiber lasers using machine learning and sparse representation.
Optics Express, **22**(7):8585–8597, 2014.

5. **S. L. Brunton**, X. Fu, and J. N. Kutz.
Extremum-seeking control of a mode-locked laser.
IEEE Journal of Quantum Electronics, **49**(10):852–861, 2013.

4. **S. L. Brunton**, C. W. Rowley, and D. R. Williams.
Reduced-order unsteady aerodynamic models at low Reynolds numbers.
Journal of Fluid Mechanics, **724**:203–233, 2013.

3. **S. L. Brunton** and C. W. Rowley.
Empirical state-space representations for Theodorsen's lift model.
Journal of Fluids and Structures, **38**:174–186, 2013.

2. **S. L. Brunton**, C. W. Rowley, S. R. Kulkarni, and C. Clarkson.
Maximum power point tracking for photovoltaic optimization using ripple-based extremum seeking control.
IEEE Transactions on Power Electronics, **25**(10):2531–2540, 2010.

1. **S. L. Brunton** and C. W. Rowley.
Fast computation of finite-time Lyapunov exponent fields for unsteady flows.
Chaos **20**(1), 2010.

SUBMITTED FOR PUBLICATION

23. D. Sashidhar, S. Sahba, C. C. Wilcox, A. McDaniel, **S. L. Brunton**, and J. N. Kutz
Dynamic mode decomposition for Aero-Optic Wavefront Characterization, 2021.

22. Z. Wu, **S. L. Brunton**, and S. Revzen
Challenges in dynamic mode decomposition, 2021.

21. J. N. Kutz and **S. L. Brunton**
Parsimony as the Ultimate Regularizer for Physics-Informed Machine Learning, 2021.

20. A. Jalalvand, A. A. Kaptanoglu, A. V. Garcia, A. O. Nelson, J. Abbate, M. E. Austin, G. Verdoolaege, **S. L. Brunton**, W. W. Heidbrink, and E. Kolemen
Alfvén eigenmode classification based on ECE diagnostics at DIII-D using deep recurrent neural networks, 2021.

19. B. Herrmann, **S. L. Brunton**, J. E. Pohl, and R. Semaan
Gust mitigation through closed-loop control. Part II: feedforward and feedback control, 2021.

18. J. E. Pohl, R. Radespiel, B. Herrmann, **S. L. Brunton**, and R. Semaan
Gust mitigation through closed-loop control. Part I: Trailing-edge flap response, 2021.

17. F. Renda, G. Mengaldo, **S. L. Brunton**, M. Bacher, M. Calisti, G. S. Chirikjian, and C. Laschi
Towards digital soft-robotic twins?, 2021.

16. A. Mendible, W. Lowrie, **S. L. Brunton**, and J. N. Kutz

Data-driven Modeling of Two-Dimensional Detonation Wave Fronts, 2021.

15. M. Kalia, **S. L. Brunton**, H. G. E. Meijer, C. Brune, and J. N. Kutz
Learning normal form autoencoders for data-driven discovery of universal, parameter-dependent nonlinear dynamics, 2021.

14. J. L. Callaham, **S. L. Brunton**, and J.-Ch. Loiseau
On the role of nonlinear correlations in reduced-order modeling, 2021.

13. P. J. Baddoo, H. Herrmann, B. J. McKeon, and **S. L. Brunton**
Kernel Learning for Robust Dynamic Mode Decomposition: Linear and Nonlinear Disambiguation Optimization (LANDO), 2021

12. J. L. Callaham, G. Rigas, J.-Ch. Loiseau, and **S. L. Brunton**
An empirical mean-field model of symmetry-breaking in a turbulent wake, 2021.

11. K. Krishna, Z. Song, and **S. L. Brunton**
Finite-horizon, energy-optimal trajectories in unsteady flows, 2021.

10. S. N. Rodriguez, A. P. Iliopoulous, K. T. Carlberg, **S. L. Brunton**, J. C. Steuben, and J. G. Michopoulos
Projection-tree reduced order modeling for fast N-body computations, 2021.

9. B. Strom, B. Polagye, and **S. L. Brunton**
Near-wake dynamics of a vertical-axis turbine, 2021.

8. C. R. Gin, D. E. Shea, **S. L. Brunton**, and J. N. Kutz
DeepGreen: Deep learning of Green's functions for nonlinear boundary value problems, 2020.

7. Y. Liu, J. N. Kutz, and **S. L. Brunton**
Deep learning of time-steppers for differential equations and multiscale physics, 2020.

6. K. Kaheman, **S. L. Brunton**, and J. N. Kutz
Automatic Differentiation to Simultaneously Identify Nonlinear Dynamics and Extract Noise Probability Distributions from Data, 2020.

5. D. Dylewsky, E. Kaiser, **S. L. Brunton**, and J. N. Kutz
Principal Component Trajectories (PCT): Nonlinear dynamics as a superposition of time-delayed periodic orbits, 2020.

4. Y. Liu, C. Ponce, **S. L. Brunton**, and , J. N. Kutz
A multiresolution convolutional autoencoder for multiscale spatial-temporal data, 2020.

3. C.-H. Walter, K. S. Lerch, **S. L. Brunton**, and G. Brenner
Analysis of Detached Flows in Turbomachines by Dynamic Mode Decomposition, 2019.

2. N. B. Erichson, L. Mathelin, **S. L. Brunton**, and J. N. Kutz.
Diffusion maps meet Nystrom.

1. S. D. Pendergrass, J. N. Kutz, and **S. L. Brunton**
Streaming GPU Singular Value and Dynamic Mode Decompositions.

CONFERENCE PAPERS

33. U. Fasel, E. Kaiser, B. W. Brunton, J. N. Kutz, and **S. L. Brunton**.
SINDy with Control: A Tutorial.
Conference on Decision and Control, 2021.

32. I. Scherl, **S. L. Brunton**, and B. Polagye.
Parameter Modeling of a Two Cross-flow Turbine Array.

14th European Wave and Tidal Energy Conference, Plymouth, England, September 5-9, 2021.

31. M. Kalia, C. Brune, H. G. E. Meijer, **S. L. Brunton**, and J. N. Kutz.
Deep learning of normal form autoencoders for universal, parameter-dependent .
NeurIPS Workshop, 2020.

30. C. Gong, L. Trutiou, B. Schowengerdt, **S. L. Brunton**, E. J. Seibel.
Real-time Retinal Localization for Eye-tracking in Head-mounted Displays.
CVPR Workshop on Computer Vision for Augmented and Virtual Reality, June 2020.

29. K. Kaheman, E. Kaiser, B. Strom, J. N. Kutz, and **S. L. Brunton**.
Learning Discrepancy Models from Experimental Data.
Conference on Decision and Control, December 2019.

28. S. Ouala, **S. L. Brunton**, D. Nguyen, L. Drumetz and R. Fablet. Learning Constrained Dynamical Embeddings for Geophysical Dynamics. *Climate Informatics*, 2019.

27. J. N. Kutz, S. Rudy, A. Alla and **S. L. Brunton**.
Data-driven discovery of governing physical laws and their parametric dependencies in engineering, physics and biology.
IEEE ICASSP, Curacao, 2018.

26. E. Kaiser, J. N. Kutz, and **S. L. Brunton**.
Discovering conservation laws from data for control.
Conference on Decision and Control, December 2018.

25. Mathieu Le Provost, David R. Williams, and **S. L. Brunton**.
SINDy analysis of disturbance and plant model superposition on a rolling delta wing.
AIAA Aviation, Atlanta, GA, June 2018.

24. S. L. Brunton.
Flow map composition to identify coherent structures.
ISFV, Zurich, Switzerland, June 2018.

23. S. L. Brunton.
Machine learning of dynamics with applications to flow control and aerodynamic optimization.
IUTAM, Santorini, Greece, June 2018.

22. J.-Ch. Loiseau, N. Deng, L. Pastur, M. Morzynski, B. R. Noack, and **S. L. Brunton**.
Sparse reduced-order modeling of the fluidic pinball.
GDR Contrôle des décollements, 2017.

21. J. N. Kutz, N. B. Erichson, T. Askham, S. Pendergrass, and **S. L. Brunton**.
Dynamic Mode Decomposition for Background Modeling.
ICCVW, 2017.

20. N. B. Erichson, **S. L. Brunton**, and J. N. Kutz.
Compressed Singular Value Decomposition for Image and Video Processing.
ICCVW, 2017.

19. K. Taira, A. G. Nair, and **S. L. Brunton**.
Vortex interaction analysis using complex network framework.
Annual Meeting of the Japan Society of Fluid Mechanics, Nagoya, Japan, September, 2016.

18. K. Taira, A. G. Nair, and **S. L. Brunton**.
Complex network analysis of unsteady fluid flows.
ICTAM, Montreal, Canada, August, 2016.

17. S. L. Brunton, J. L. Proctor, and J. N. Kutz.
Sparse Identification of Nonlinear Dynamics with Control (SINDYc).

NOLCOS, Monterey CA, August, 2016.

16. B. Strom, **S. L. Brunton**, A. Aliseda, and B. Polagye.
Comparison of acoustic Doppler and particle image velocimetry characterization of a cross-flow turbine wake.
Proceedings of the 4th Marine Energy Technology Symposium, Washington D.C., April, 2016.

15. **S. L. Brunton**, J. N. Kutz, and X. Fu.
Self-tuning fiber lasers.
SPIE Photonics West, paper 9728-61, 2016.

14. B. Strom, **S. L. Brunton**, and B. Polagye.
Consequences of preset pitch angle for cross flow turbines.
11th European Wave and Tidal Energy Conference, Nantes, France, September 5-11, 2015.

13. B. Strom, **S. L. Brunton**, and B. Polagye.
Hydrodynamic optimization of cross-flow turbines with large chord to radius ratios.
Proceedings of the 3th Marine Energy Technology Symposium, Washington D.C., April, 2015.

12. J. N. Kutz, X. Fu, and **S. L. Brunton**.
Machine learning for self-tuning optical systems.
Proceedings of the World Congress on Engineering, **1**:70–73, 2015.

11. J. N. Kutz, X. Fu, and **S. L. Brunton**.
Multi-resolution analysis of dynamical systems using dynamic mode decomposition.
Proceedings of the World Congress on Engineering, **1**:90–93, 2015.

10. M. C. Johnson, **S. L. Brunton**, N. B. Kundtz, and J. N. Kutz.
An Extremum-Seeking Controller for Dynamic Metamaterial Antenna Operation.
IEEE APWC, 2015.

9. J. N. Kutz, X. Fu, and **S. L. Brunton**.
Self-tuning fiber lasers: machine learning applied to optical systems.
Nonlinear Photonics, July 2014.

8. M. C. Johnson, **S. L. Brunton**, J. N. Kutz, and N. B. Kundtz.
Sidelobe canceling on a reconfigurable holographic metamaterial antenna.
IEEE APWC, 2014.

7. T. Duriez, V. Parezanovic, J.-C. Laurentie, C. Fourment, J. Delville, J.-P. Bonnet, L. Cordier, B. R. Noack, M. Segond, M. W. Abel, N. Gautier, J.-L. Aider, C. Raibaudo, C. Cuvier, M. Stanislas, and **S. L. Brunton**.
Closed-loop control of experimental shear flows using machine learning (Invited).
AIAA Paper 2014-XXXX, 7th Flow Control Conference, June 2014.

6. **S. L. Brunton**, C. W. Rowley, and D. R. Williams.
Linear unsteady aerodynamic models from wind tunnel measurements.
AIAA Paper 2011-3581, 41st Fluid Dynamics Conference and Exhibit, June 2011.

5. **S. L. Brunton**, and C. W. Rowley.
Low-dimensional state-space representations for classical unsteady aerodynamic models.
AIAA Paper 2011-476, 49th AIAA Aerospace Sciences Meeting and Exhibit, Jan. 2011.

4. **S. L. Brunton**, and C. W. Rowley.
Unsteady aerodynamic models for agile flight at low Reynolds numbers.
AIAA Paper 2010-552, 48th AIAA Aerospace Sciences Meeting and Exhibit, Jan. 2010.

3. **S. L. Brunton**, C. W. Rowley, S. R. Kulkarni, and C. Clarkson.
Maximum power point tracking for photovoltaic optimization using extremum seeking.

34$^{\text{th}}$ IEEE Photovoltaic Specialist Conference, June 2009.

2. S. L. Brunton, and C. W. Rowley.
Modeling the unsteady aerodynamic forces on small-scale wings.
AIAA Paper 2009-1127, 47$^{\text{th}}$ AIAA Aerospace Sciences Meeting and Exhibit, Jan. 2009.

1. S. L. Brunton, C. W. Rowley, K. Taira, T. Colonius, J. Collins, and D. R. Williams.
Unsteady aerodynamic forces on small-scale wings: Experiments, simulations & models.
AIAA Paper 2008-520, 46$^{\text{th}}$ AIAA Aerospace Sciences Meeting and Exhibit, Jan. 2008.

BOOK CHAPTERS

9. S. L. Brunton and J. N. Kutz
Targeted use of deep learning for physics and engineering
Science-guided Machine Learning: Emerging Trends in Combining Scientific Knowledge with
Data-driven Methods; Editors: Anuj Karpatne, Ramakrishnan Kanan, and Vipin Kumar
Data Mining and Knowledge Discovery Series of CRC Press, 2021.

8. S. L. Brunton
Machine Learning of Dynamics with Applications to Flow Control and Aerodynamic Optimization
Advances in Critical Flow Dynamics Involving Moving/Deformable Structures with Design Applications, Springer *Notes on Numerical Fluid Mechanics and Multidisciplinary Design* **147**, 2021.

7. E. Kaiser, J. N. Kutz, and **S. L. Brunton**
Data-Driven Approximations of Dynamical Systems Operators for Control
The Koopman Operator in Systems and Control, Springer, 2020.

6. J.-Ch. Loiseau, B. R. Noack, and **S. L. Brunton**
From the POD-Galerkin method to sparse manifold models
Handbook on Model Reduction, 2019.

5. S. L. Brunton and J. N. Kutz
Data-driven methods for reduced order modeling
Handbook on Model Reduction, 2019.

4. J. N. Kutz, S. Sargsyan, and **S. L. Brunton**
Leveraging sparsity and compressive sensing for reduced order modeling
MoRePaS, 2016.

3. Z. Bai, **S. L. Brunton**, B. W. Brunton, J. N. Kutz, E. Kaiser, A. Spohn, and B. R. Noack
Data-driven methods in fluid dynamics: Sparse classification from experimental data
Whither Turbulence and Big Data in the 21st Century (Springer, 2016).

2. J. N. Kutz, **S. L. Brunton**, and X. Fu
Data methods and computational tools for characterizing complex cavity dynamics
Nonlinear Optical Cavity Dynamics: From Microresonators to Fiber Lasers, P. Grelu Ed. (Wiley-VCH Verlag GmbH & Co. KGaA, 2016).

1. J. N. Kutz, X. Fu, **S. L. Brunton**, and J. Grosek
Dynamic mode decomposition for robust PCA with applications to foreground/background subtraction in video streams and multi-resolution analysis
CRC Handbook on Robust Low-Rank and Sparse Matrix Decomposition: Applications in Image and Video Processing, T. Bouwmans Ed. (CRC Press, 2015).

FUNDING

Active ($7M out of $39M)

8. $20,000k NSF. "AI Institute in Dynamic Systems" (Co-PI & Associate Director, Kutz PI)

7. $1,000k ARO PECASE. "PECASE: Uncovering Nonlinear Flow Physics with Machine Learning Control and Sparse Modeling." (PI)

6. $600k NSF/DOE. "Improving Interpretable Machine Learning for Plasmas: Towards Physical Insight, Data-Driven Models, and Optimal Sensing." (Co-PI, Hansen PI)

5. $1,000k AFOSR. "Data-driven control of unsteady flows." (Co-PI, Taira PI)

4. $7,500k AFOSR MURI. "Neural-inspired sparse sensing and control for agile flight." (Co-PI, B. W. Brunton PI)

3. $2,000k NSF HDR. "HDR: I-DIRSE-FW: Accelerating the Engineering Design and Manufacturing Life-Cycle with Data Science." (Co-PI, Balazinska PI)

2. $450k AFOSR YIP. "YIP: Interpretable Nonlinear Models of Unsteady Flow Physics." (PI)

1. $6,000k ARO MURI. "From Data-Driven Operator Theoretic Schemes to Prediction, Inference and Control of Systems." (Co-PI, Mezic PI)

Past ($6M out of $12M)

19. $2,000k The Boeing Company. "Boeing Data Science Research." (PI)

18. $750k AFOSR. "Network-based feedback control of fluid flows." (Co-PI, Taira PI)

17. $450k ARO. "Active turbulence control from a network-theoretic perspective." (Co-PI, Taira PI)

16. $400k The Boeing Company. "Bracket Standardization." (PI)

15. $360k ARO YIP. "YIP: Uncovering Nonlinear Flow Physics with Machine Learning Control and Sparse Modeling." (PI)

14. $1,000k DARPA. "Physics Inspired Learning and Learning the Order and Structure of Physics" (Co-PI, Kutz PI)

13. $150k The Boeing Company. "Automated Fiber Placement." (Co-PI, Banerjee PI)

12. $333k The Boeing Company. "Multi-Robot Control." (Co-PI, Devasia PI)

11. $1,100k DOE. "3rd Generation integrated instrumentation: Enhancements to the adaptable monitoring package." (Co-PI, Polagye PI)

10. $835k DOE. "*SWIFT*: A rapid approach to evaluating marine energy converter sound." (Co-PI, Polagye PI)

9. $445k AFRL. "Integrating compressive sensing and machine learning for outer-loop target tracking control on an autonomous quadrotor aircraft." (Co-PI, B. W. Brunton PI)

8. $215k The Boeing Company. "Executive Data Science Workshops." (PI)

7. $650k the NSF. "MRI: Development of a hyper-sensed environmentally controlled wind tunnel" (PI w/ Riffell, Co-PIs Aliseda, Morgansen, Thornton)

6. $1,000k DARPA. "Koopman operator theory and applications" (Co-PI, Mezic PI)

5. $250k AFOSR SBIR. "Scalable Real-Time Background/Foreground Separation using Dynamic Mode Decomposition." (Co-PI, Kutz PI)

4. $1,202k DOE. "Advanced Laboratories and Field Arrays." (Co-PI, DOE Consortium)

3. $999k DOE. "An intelligent Adaptable Monitoring Package for Marine Renewable Energy Projects." (Co-PI, DOE FOA-0000971 Topic 2, Polagye PI)

2. $643k The Boeing Company. "Predictive Shimming." (PI, Boeing A96600)

1. $278k DOE. "Automatic optical detection and classification of marine animals around MHK converters using machine vision." (PI, DOE EE-0006785)

Mentoring & Advising

Current (2 Postdocs, 11 PhD)

Postdocs:
Joseph Bakarji [2020-present]. Postdoctoral Fellow, *w/ N. Kutz)*
Urban Fasel [2020-present]. Postdoctoral Fellow, *w/ N. Kutz and B. Brunton)*

PhDs:
Brittany Lydon [2021-present]. PhD UW ME, *(w/ B. Polagye)*
Joey Williams [2020-present]. PhD UW AMATH, *(w/ N. Kutz)*
Frank Mei [2020-present]. PhD UW AMATH, *(w/ N. Kutz)*
Michelle Hickner [2019-present]. PhD UW ME, *(w/ B. Brunton)*
Alan Kaptanoglu [2019-present]. PhD UW Physics
Kartik Krishna [2019-present]. PhD UW ME
Yuying Liu [2019-present]. PhD UW AMATH *(w/ N. Kutz)*
Kahdirdan Kahirman [2018-present]. PhD UW ME *(w/ N. Kutz)*
Jared Callaham [2018-present]. PhD UW ME
Isabel Scherl [2017-present]. PhD UW ME, *(w/ B. Polagye)*
Chen Gong [2016-present]. PhD UW ME, *(w/ E. Seibel)*

Lab Alumni (9 Postdocs, 11 PhDs graduated, 3 Masters, 2 Undergraduates, 6 Highschool)

Postdocs:
Jason Bramburger [2020-present]. Acting Assistant Professor, *w/ N. Kutz)*
    (Next position: Assistant Professor, George Washington University)
Jordan Snyder [2019-present]. Postdoctoral Fellow, *(w/ N. Kutz)*
    (Next position: Postdoctoral Fellow, U. Copenhagen)
Benjamin Herrmann [2019-2021]. DAAD Fellow, *(w/ R. Semaan)*
    (Next position: Assistant Professor, U. Chile)
Eurika Kaiser [2016-2021]. Moore Sloan Data Science Postdoctoral Fellow, *(w/ N. Kutz)*
    (Next position: Private Consultant, Berlin)
Aditya Nair [2018–2020]. Postdoctoral Fellow, *(w/ B. Brunton)*
    (Next position: Assistant Professor, UN Reno)
Brian DeSilva [2020]. Postdoctoral Fellow, *(w/ N. Kutz)*
    (Next position: Machine Learning Engineer, Amazon)
Kazuki Maeda [2018-2019]. Acting Assistant Professor
    (Next position: Postdoctoral Fellow, Stanford)
Bethany Lusch [2016-2018]. Postdoctoral Fellow, *(w/ B. Brunton & N. Kutz)*
    (Next position: Assistant Computer Scientist, Argonne National Lab)
Ben Erichson [2016-2018]. Postdoctoral Fellow, *(w/ N. Kutz)*
    (Next position: Postdoctoral Fellow, Berkeley)

PhDs Graduated:
Ariana Mendible [2017-2021]. PhD UW ME, *(w/ N. Kutz)*
    (Next position: Assistant Professor, Seattle University)
Dan Shea [2019-2021]. PhD UW Materials, *(w/ N. Kutz)*
Emily Clark [2016-2020]. PhD UW Physics, *(w/ N. Kutz)*

(Next position: Engineer, BAE Systems)
Brian DeSilva [2017-2020]. PhD UW AMATH, *(w/ N. Kutz)*
    (Next position: Postdoctoral Fellow, UW)
Thomas Mohren [2016-2020]. PhD UW ME, *(w/ T. Daniel)*
    (Next position: Postdoctoral Fellow, Rockefeller University)
Kathleen Champion [2017-2019]. PhD UW AMATH, *(w/ N. Kutz)*
    (Next position: Machine Learning Engineer, Amazon)
Sam Rudy [2016-2019]. PhD UW AMATH, *(w/ N. Kutz)*
    (Next position: NSF Postdoctoral Fellow, MIT)
Ben Strom [2014-2019]. PhD UW ME, *(w/ B. Polagye)*
    (Next position: Co-Founder X-Flow Energy)
Krithika Manohar [2013-2018]. PhD UW AMATH, *(w/ N. Kutz)*
    (Next position: NSF Postdoctoral Fellow, Caltech)
Zhe Bai [2014-2018]. PhD UW ME
    (Next position: Postdoctoral Fellow, Lawrence Berkeley Labs)
Michael Au-Yeung [2014-2016]. PhD UW ME, *(w/ P. Reinhall)*
    (Next position: Postdoctoral Fellow, Harvard Medical School)

Emma Hansen [2020], Masters student at UW
    (Next position: PhD student, UBC)
Tadbhagya Kumar [2015-2016]. Masters student at UW, *(w/ J. Riley)*
    (Next position: PhD student, UF)
Sudharsan Madhavan [2012-2014]. Masters student at UW, *(w/ J. Riley)*
    (Next position: PhD student, Tufts)

Seth Pendergrass [2014-2016]. Undergraduate at UW
    (Next position: Engineer, Microsoft)
Jessica Fortino [2014]. Undergraduate at UW
    (Next position: Engineer, Seattle Public Utility)

Sanya Gupta [2020-2021]. High school student at Lakeside
    (Next position: Undergraduate, Columbia)
Jessica Ruan [2020-2021]. High school student at Lakeside
    (Next position: Undergraduate, CMU)
Aria Tang [2020-2021]. High school student at Lakeside
    (Next position: Undergraduate, UW)
Christina Yao [2019-2020]. High school student at Lakeside
    (Next position: Undergraduate, CMU)
Eric Chen [2019-2020]. High school student at Lakeside
    (Next position: Undergraduate, Princeton)
Surtaz Khan [2017-2019]. High school student at Lakeside
    (Next position: Undergraduate, Yale)

TEACHING

Workshops and Teaching Abroad

- **VKI Machine Learning in Fluids, Brussels**, 2020

- **DAMPT Summer School, Cambridge UK**, 2019

- **IPAM Long Workshop, UCLA, CA**, 2019

- **Rome Workshop and Summer School**, 2017

Instructor, University of Washington

- **ME565 - Mechanical Engineering Analysis II**,
  Winter 2020, 143 students, Course Evaluations: Median 4.7/5.0, Adj. Median 4.8/5.0
  Winter 2019, 120 students, Course Evaluations: Median 4.6/5.0, Adj. Median 4.7/5.0
  Winter 2018, 147 students, Course Evaluations: Median 4.6/5.0, Adj. Median 4.9/5.0
  Winter 2017, 122 students, Course Evaluations: Median 4.8/5.0, Adj. Median 4.8/5.0
  Winter 2016, 96 students, Course Evaluations: Median 4.7/5.0, Adj. Median 4.8/5.0
  Winter 2015, 62 students, Course Evaluations: Median 4.8/5.0, Adj. Median 5.0/5.0

- **ME564 - Mechanical Engineering Analysis I**,
  Fall 2018, 132 students, Course Evaluations: Median 4.8/5.0, Adj. Median 4.8/5.0
  Fall 2017, 149 students, Course Evaluations: Median 4.8/5.0, Adj. Median 4.9/5.0
  Fall 2016, 127 students, Course Evaluations: Median 4.8/5.0, Adj. Median 4.9/5.0
  Fall 2015, 88 students, Course Evaluations: Median 4.8/5.0, Adj. Median 4.9/5.0
  Fall 2014, 67 students, Course Evaluations: Median 4.9/5.0, Adj. Median 4.8/5.0

- **ME520 - Control Theory Bootcamp**,
  Winter 2017, 8 students, Course Evaluations: Median 4.8/5.0, Adj. Median 4.8/5.0

- **AMATH301 - Beginning Scientific Computing**,
  Spring 2014, 309 students
  Winter 2014, 309 students, Course Evaluations: Median 3.86/5.0, Adj. Median 4.1/5.0
  Fall 2013, 368 students, Course Evaluations:
  Winter 2013, 300 students, Course Evaluations: Median 3.9/5.0, Adj. Median 4.1/5.0

Teaching Assistant, Princeton University

- **MAE434 - Modern Control**, Fall 2009
- **MAE433 - Automatic Control Systems**, Spring 2009, 2010
- **MAE331 - Aircraft Flight Dynamics**, Fall 2008

Teaching Assistant, California Institute of Technology
- **CDS140ab - Introduction to Dynamics**, Fall 2005, Spring 2006

INVITED TALKS (SLB INVITED)

2021, Sept.	Turing Institute DCEng, Virtual
2021, Sept.	Leipzig, Virtual
2021, July	SIAM Annual Meeting, Virtual
2021, July	DE Shaw, Virtual
2021, May	SIAM DS, Virtual
2021, May	U. Melbourne Seminar, Virtual
2021, May	Boeing Engineering Leadership Meeting, Virtual (**To all senior engineering VPs**)
2021, May	Caltech Control Meets Learning Seminar, Virtual
2021, April	Strathclyde Seminar, Virtual
2021, April	AIAA PNW Lecture, Virtual
2021, April	KTH AC&ML Seminar, Virtual
2021, April	TU-Braunschweig Seminar, Virtual
2021, April	Berkeley DREAM/CPAR Seminar, Virtual
2021, Mar.	Stevens Institute of Technology Seminar, Virtual
2021, Mar.	Lisbon Seminar, Virtual
2021, Mar.	APS March Meeting, Virtual
2021, Mar.	SIAM CSE, Virtual
2021, Mar.	VKI, Virtual (**Keynote**)
2021, Mar.	Amazon Salons
2021, Mar.	IEEE Robotics Podcast
2021, Feb.	Texas A&M Seminar, Virtual
2021, Feb.	Imperial College London Seminar, Virtual
2021, Jan.	Rutgers Seminar, Virtual
2021, Jan.	UPenn Seminar, Virtual
2021, Jan.	Engineering Mind Podcast, Virtual
2021, Jan.	LNLL Seminar, Virtual
2021, Jan.	Boeing D-BRASS Seminar, Virtual
2021, Jan.	AIAA SciTech Meeting, Virtual
2021, Jan.	Stanford Fluids Seminar, Virtual
2021, Jan.	Network Science for Fluid Mechanics, Virtual
2021, Jan.	WCCM/ECCOMAS 2020, Virtual (**Minisymposium Keynote**)
2021, Jan.	IPAM Transport and Mixing in Complex and Turbulent Flows, Virtual
2020, Dec.	WorldQuant, Virtual (**Bridgestone Lecture**)
2020, Dec.	Aggregate Intellect Spotlight Talk, Virtual
2020, Nov.	ORNL Seminar, Virtual (w/ Kaptanoglu)
2020, Nov.	AAAI Symposium on Physics-Guided AI to Accelerate Scientific Discovery, Virtual
2020, Nov.	Universidade do Estado de Santa Catarina Brazil Seminar, Virtual
2020, Nov.	ARO/ARL Seminar on Data-Driven Modeling and Discovery, Virtual (w/ Callaham)
2020, Oct.	2020 Computational Infrastructure for Geodynamics (CIG) Community Workshop, Virtual (**Plenary**)
2020, Sept.	Second Symposium on Machine Learning and Dynamical Systems, Fields Institute, Toronto, Virtual (**Plenary**)
2020, Sept.	UC Merced Mechanical Engineering Seminar Series, Virtual
2020, Sept.	University of Virginia Design and Data Analysis (DADA) lecture series, Virtual
2020, Aug.	UTD Mechanical Engineering Seminar Series, Virtual
2020, Aug.	4th IEEE Conference on Control Technology and Applications, Virtual (**IEEE Young Professionals Special Event**)

2020, Aug.	NRL Seminar, Virtual
2020, July	Cirrus Tech Talk, Virtual
2020, Feb.	University of Hawaii Manoa Seminar, Waikiki, HA
2020, Feb.	NSF Workshop: Exuberance of Machine Learning in Transport Phenomena, Dallas, TX
2019, Nov.	APS DFD, Seattle, WA
2019, Nov.	Caltech GALCIT Seminar, Pasadena, CA
2019, Nov.	USC Seminar, Los Angeles, CA
2019, Oct.	UCLA IPAM Seminar, Los Angeles, CA
2019, Oct.	Rice ME Seminar, Los Angeles, CA
2019, Oct.	UCLA ECE Seminar, Los Angeles, CA
2019, June	Boeing CTO's DM4SC Forum, Renton, WA
2019, June	MolKyn19, Berlin, Germany
2019, June	Workshop on Multisensory Integration in Insect Flight Dynamics, Bangalore, India
2019, May	DTU Applied Mathematics and Computer Science Dept., Copenhagen, Denmark
2019, May	SIAM Dynamical Systems, Snowbird, UT
2019, April	OSU Seminar, Ohio State University, Columbus, OH
2019, April	Aerospace Engineering Seminar, Georgia Tech, Atlanta, GA
2019, April	Electrical and Systems Engineering Seminar, Washington University, St. Louis, MO
2019, April	SILO Seminar, UW, Madison, WI
2019, April	Biophysics and Soft Matter Seminar, Simon Fraser, Vancouver, BC, Canada
2019, Feb.	SIAM, Computational Science and Engineering Conference, Spokane WA **(Early Career Prize Plenary)**
2019, Feb.	SIAM, Computational Science and Engineering Conference, Spokane WA
2019, Feb.	GAMM, Vienna, Austria, **(Topical Keynote)**
2019, Feb.	Geophysical flows workshop, Rennes, France, **(Keynote)**
2018, Nov.	APS DFD, Atlanta, GA
2018, Nov.	Georgia Tech Aero Seminar, Atlanta, GA
2018, Nov.	AI & Geophysical Dynamics, Brest, France, **(Keynote)**
2018, Nov.	Boeing Distinguished Research and Scholar Seminar (B-DRASS), Everettt, WA
2018, Sept.	Carderock Site visit at UW Applied Physics Lab, Seattle, WA
2018, Sept.	ITRI Taiwanese Delegation, Seattle, WA
2018, July	WCCM mini-symposium, New York NY, **(Keynote)**
2018, May	University of Washington Industrial and Systems Engineering Seminar, Seattle, WA
2018, April	Johns Hopkins Center for Environ. & Applied Fluid Mech. Seminar, Baltimore MD
2018, April	USC Center for Systems and Control Seminar, Los Angeles, CA
2018, April	SIAM Uncertainty Quantification, Los Angeles, CA
2018, Mar.	RIKEN Institute, Tokyo, Japan
2018, Mar.	US-Japan Workshop on Bridging Fluid Mechanics and Data Science, Tokyo, Japan
2018, Mar.	Department Seminar, TU Munich, Munich, Germany
2018, Mar.	GAMM Conference, Munich, Germany
2018, Mar.	UWIN Seminar, Seattle, WA
2017, Dec.	Seminar at Paderborn, Germany
2017, Dec.	DFG Workshop, Goetingham, Germany, **(Keynote)**
2017, Nov.	APS DFD, Denver, CO
2017, Nov.	West Coast ROM Workshop, Berkeley CA, **(Keynote)**
2017, Nov.	AOS Workshop, Seattle, WA
2017, Nov.	IPAM Workshop, UCLA, Los Angeles CA
2017, Sept.	Set Oriented Numerics Workshop, Santa Barbara CA, **(Keynote)**

2017, July	State of the Art Review (SOAR8), Oxford, UK
2017, July	wMLC-2 Workshop, Valenciennes, France, **(Plenary)**
2017, June	Boeing BARC seminar, Harbor Point Technical Center, Harbor Point, WA
2017, May	SIAM Dynamical Systems, Snowbird, UT
2017, May	MIT Applied Mathematics Seminar, Cambridge MA
2017, April	Virginia Tech Applied Mathematics Seminar, Blacksburg VA
2017, April	Harvard Applied Mathematics Seminar, Cambridge MA
2017, March	APS March Meeting, New Orleans, LA
2017, March	SIAM Conference on Computational Science and Engineering, Atlanta, GA
2017, Jan.	Banff BIRS Workshop, Banff, Canada, **(Plenary)**
2017, Jan.	Neural Computation and Engineering Connection, Seattle, WA
2017, Jan.	Caltech MCE Seminar, Pasadena, CA
2016, Nov.	DARPA Workshop, Santa Barbara, CA
2016, Oct.	The Future of Vibration Energy Transfer in Solids & Structures Workshop, Seattle, WA
2016, Aug.	NOLCOS, Monterey, CA
2016, July	UTRC, Hartford, CT
2016, July	SIAM Annual Meeting, Boston, MA
2016, June	Boeing Workshop, Seattle WA
2016, June	AIAA Aviation Meeting, DC
2016, April	Laboratoire d'Hydrodynamique de l'Ecole polytechnique, Paris, France
2016, April	Laboratoire d'Informatique pour la Mécanique et les Sciences de l'Ingenieur, France
2016, April	SIAM Conference on Uncertainty Quantification, Lausanne, Switzerland
2016, March	Courant Institute of Mathematical Sciences, New York, NY
2015, Nov.	United Technologies Research Corporation, Hartford, CT
2015, Aug.	International Congress on Industrial and Applied Mathematics, Beijing, China
2015, July	Bifurcations in Fluid Dynamics, Paris, France
2015, July	SIAM Conference on Control and its Applications, Paris, France
2015, May	SIAM Dynamical Systems, Snowbird, UT
2015, April	Whither Turbulence and Big Data in the 21st Century, Corsica, France
2015, March	SIAM Conference on Computational Science and Engineering, Salt Lake City
2015, Feb.	SFB 880 Flow Control Workshop, TU-Braunschweig, Germany
2015, Feb.	TU-Berlin, Germany
2014, Aug.	Berkeley Electrical Engineering Semi-Autonomous Group, Berkeley, CA
2014, April	SIAM Conference on Uncertainty Quantification, Savannah GA
2014, Jan.	UW Mechanical Engineering Seminar, Seattle, WA
2013, May	SIAM Dynamical Systems
2013, April	PPRIME, Poitiers France
2013, April	MIT, Physical Mathematics Seminar, Cambridge MA
2013, Feb.	SIAM Conference on Computational Science and Engineering
2012, Oct.	University of Washington, Applied Physics Laboratory, Seattle, WA
2012, Sept.	United Technologies Research Center, Hartford CT
2012, June	42nd AIAA Fluid Dynamics Conference
2011, Oct.	University of Washington, Applied Math Department, Seattle, WA
2011, June	41st AIAA Fluid Dynamics Conference
2011, May	SIAM Conference on Applications of Dynamical Systems
2011, March	Illinois Institute of Technology, Mechanical, Materials and Aerospace Engineering
2006, Dec.	Princeton Program in Applied and Computational Mathematics, Dynamical Systems & Nonlinear Science Seminar

OTHER TALKS

2021, July	USNCCM16, Virtual (Scherl, Strom, Shang, Williams, Polagye, Brunton; **Minsymposium Keynote**)
2021, July	USNCCM16, Virtual (Herrmann, Baddoo, Semaan, Brunton, McKeon; **Minsymposium Keynote**)
2021, July	USNCCM16, Virtual (Fasel, Fonzi, Brunton)
2021, July	USNCCM16, Virtual (Callaham, Rigas, Loiseau, Brunton)
2020, Nov.	APS DFD, Virtual (Brunton, Baddoo, Herrmann, McKeon)
2020, Nov.	APS DFD, Virtual (Rodriguez, Iliopoulos, Brunton, Carlberg, Michopoulos)
2020, Nov.	APS DFD, Virtual (Kaptanoglu, Morgan, Hansen, Brunton)
2020, Nov.	APS DFD, Virtual (Krishna, Song, Brunton)
2020, Nov.	APS DFD, Virtual (Nair, Strom, Brunton, Brunton)
2020, Nov.	APS DFD, Virtual (Mendible, Koch, Lange, Brunton, Kutz)
2020, Nov.	APS DFD, Virtual (Callaham, Kutz, Brunton, Brunton)
2020, Nov.	APS DFD, Virtual (Dawson, Brunton)
2020, Nov.	APS DFD, Virtual (Kaiser, Kutz, Brunton)
2020, Nov.	APS DFD, Virtual (Fasel, Fonzi, Brunton)
2020, Nov.	APS DFD, Virtual (Scherl, Strom, Shang, Williams, Polagye, Brunton)
2020, Nov.	APS DFD, Virtual (Herrmann, Pohl, Brunton, Semaan)
2020, Nov.	Michigan Institute for Data Science (MIDAS) Annual Symposium (Wu, Brunton, Revzen)
2020, Oct.	GDR Flow Control, France, Virtual (Noack, Li, Fan, Zhou, Li, Tan, Maceda, Lusseyran, Deng, Pastur, Fernex, Semaan, Albers, Schroder, Morzynski, Brunton; **Keynote**)
2020, June	Network Science for Fluid Dynamics, Virtual (Nair, Brunton, Taira; **invited**)
2020, May	AIAA AVIATION, Virtual (Nair, Brunton, Taira; **invited**)
2019, Nov.	APS DFD, Seattle, WA (Scherl, Strom, Brunton, Polagye)
2019, Nov.	APS DFD, Seattle, WA (Li, Kaiser, Laima, Li, Brunton, Kutz)
2019, Nov.	APS DFD, Seattle, WA (Lange, Brunton, Kutz)
2019, Nov.	APS DFD, Seattle, WA (Nair, Taira, Brunton, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Herrmann, Brunton, Semaan)
2019, Nov.	APS DFD, Seattle, WA (De Silva, Higdon, Brunton, Kutz)
2019, Nov.	APS DFD, Seattle, WA (Bai, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Callaham, Loiseau, Kutz, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Kaheman, Kaiser, Nair, Kutz, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Champion, Lusch, Kutz, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Novosselov, Guan, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Gin, Lusch, Brunton, Kutz)
2019, Nov.	APS DFD, Seattle, WA (Clark, Askham, Brunton, Kutz)
2019, Nov.	APS DFD, Seattle, WA (Manohar, Kutz, Brunton)
2019, Nov.	APS DFD, Seattle, WA (Mendible, Aravkin, Lowrie, Brunton, Kutz)
2019, Nov.	APS DFD, Seattle, WA (Krishna, Nair, Kaiser, Brunton)
2019, May	SIAM DS, Snowbird, UT (Kutz, Lusch, Brunton; *invited*)
2019, May	SIAM DS, Snowbird, UT (Manohar, Kutz, Brunton; *invited*)
2019, May	SIAM DS, Snowbird, UT (Kaiser, Brunton, Kutz; *invited*)
2019, May	SIAM DS, Snowbird, UT (Dawson, Brunton; *invited*)
2019, May	SIAM DS, Snowbird, UT (Nair, Yeh, Kaiser, Noack, Brunton, Taira; *invited*)
2019, May	SIAM DS, Snowbird, UT (Mangan, Askham, Brunton, Kutz, Proctor; *invited*)

2019, May	Seventeenth International Conference on Numerical Combustion, Aachen, Germany (Bieker, Peitz, Brunton, Kutz, Dellnitz)
2019, April	PCM-CMM, Krakow, Poland (Noack, Fan, Zhou, Li, Kaiser, Brunton; **Plenary**)
2019, Feb.	SIAM CSE, Spokane, WA (Callaham, Maeda, Brunton; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Bai, Carlberg, Peng, Brunton; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Kaiser, Brunton, Kutz; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Kutz, Rudy, Brunton; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Mendible, Brunton, Kutz; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Nair, Yeh, Kaiser, Noack, Brunton, Taira; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Champion, Brunton, Kutz; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Rudy, Kutz, Brunton; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Manohar, Kutz, Brunton; *invited*)
2019, Feb.	SIAM CSE, Spokane, WA (Maeda, Brunton; *invited*)
2018, Nov.	APS DFD, Atlanta, GA (Kaiser, Kutz, Brunton)
2018, Nov.	APS DFD, Atlanta, GA (Rudy, Kutz, Brunton)
2018, Nov.	APS DFD, Atlanta, GA (Scherl, Maeda, Polagye, Brunton)
2018, Nov.	APS DFD, Atlanta, GA (Nair, Yeh, Kaiser, Noack, Brunton, Taira)
2018, Nov.	APS DFD, Atlanta, GA (Bai, Erichson, Meena, Taira, Brunton)
2018, Nov.	APS DFD, Atlanta, GA (Clark, Askham, Brunton, Kutz)
2018, Nov.	APS DFD, Atlanta, GA (Callaham, Maeda, Brunton)
2018, Nov.	APS DFD, Atlanta, GA (Mohren, Brunton, Brunton, Daniel)
2018, Nov.	APS DFD, Atlanta, GA (Strom, Scherl, Brunton, Polagye)
2018, Nov.	APS DFD, Atlanta, GA (Manohar, Kutz, Brunton)
2018, June	ISFV, Zurich, Switzerland (Brunton)
2018, June	IUTAM, Santorini, Greece (Brunton)
2018, June	NetSci, Paris, France (Meena, Bai, Yeh, Brunton, Taira)
2017, Nov.	APS DFD, Denver, CO (Kaiser, Kutz, Brunton)
2017, Nov.	APS DFD, Denver, CO (Erichson, Brunton, Kutz)
2017, Nov.	APS DFD, Denver, CO (Lusch, Kutz, Brunton)
2017, Nov.	APS DFD, Denver, CO (Bai, Kaiser, Proctor, Kutz, Brunton)
2017, Nov.	APS DFD, Denver, CO (Manohar, Kaiser, Brunton, Kutz, Brunton)
2017, Nov.	APS DFD, Denver, CO (Strom, Brunton, Polagye)
2017, May	SIAM DS, Snowbird, UT (Kunert-Graf, Proctor, Brunton, Kutz; *invited*)
2017, May	SIAM DS, Snowbird, UT (Mangan, Kutz, Brunton, Proctor; *invited*)
2017, May	SIAM DS, Snowbird, UT (Quade, Abel, Shafi, Niven, Noack, Brunton; *invited*)
2017, May	SIAM DS, Snowbird, UT (Manohar, Kaiser, Brunton, Kutz; *invited*)
2017, May	SIAM DS, Snowbird, UT (Kaiser, Noack, Spohn, Niven, Cattafesta, Morzynski, Brunton, Brunton, Kutz; *invited*)
2017, March	SIAM CSE, Atlanta, GA (Manohar, Kaiser, Brunton, Kutz; *invited*)
2017, March	SIAM CSE, Atlanta, GA (Kutz, Sargsyan, Manohar, Brunton; *invited*)
2017, March	SIAM CSE, Atlanta, GA (Nair, Taira, Brunton; *invited*)
2016, Nov.	APS DFD, Portland, OR (Brunton, Proctor, Kutz)
2016, Nov.	APS DFD, Portland, OR (Bai, Kaiser, Proctor, Kutz, Brunton)
2016, Nov.	APS DFD, Portland, OR (Kaiser, Noack, Spohn, Cattafesta, Morzynski, Caviller, Brunton, Brunton)
2016, Nov.	APS DFD, Portland, OR (Nair, Meena, Taira, Brunton)
2016, Nov.	APS DFD, Portland, OR (Manohar, Kaiser, Brunton, Kutz)
2016, Nov.	APS DFD, Portland, OR (Strom, Brunton, Polagye)

2016, Nov.	APS DFD, Portland, OR (Rudy, Brunton, Proctor, Kutz)
2016, Sept.	Annual Meeting of the Japan Society of Fluid Mechanics, Nagoya, Japan (Taira, Nair, Brunton)
2016, Aug.	ICTAM, Montreal, Canada (Taira, Nair, Brunton)
2016, July	SIAM Annual Meeting, Boston, MA (Nair, Taira, Brunton)
2016, April	Proceedings of the 4th Marine Energy Technology Symposium, Washington D.C. (Strom, Brunton, Aliseda, Polagye)
2016, Feb.	SPIE Photonics West, San Francisco, CA (Brunton, Johnson, Fu, Kutz)
2016, Jan.	AIAA Sci-Tech, San Diego, CA (Strom, Aliseda, Polagye, Brunton)
2015, Nov.	APS DFD, Boston, MA (Taira, Nair, Brunton)
2015, Nov.	APS DFD, Boston, MA (Strom, Brunton, Polagye)
2015, Nov.	APS DFD, Boston, MA (Manohar, Brunton, Kutz)
2015, Nov.	APS DFD, Boston, MA (Bai, Brunton, Brunton, Kutz, Kaiser, Spohn, Noack)
2015, Oct.	GDR 2502 Flow Separation Control and GDR MOSAR, LIMSI, Orsay, France (Noack, Duriez, Parezanovic, von Krbek, Kaiser, Cordier, Bonnet, Segond, Abel, Gautier, Aider, Raibaudo, Cuvier, Sanislas, Debien, Mazellier, Kourta, Brunton; **Plenary**)
2015, Sept.	IEEE APWC, Torino Italy (Johnson, Brunton, Kundtz, Kutz)
2015, Sept.	11th European Wave and Tidal Energy Conference, Nantes, France (Strom, Brunton, Polagye)
2015, April	Proceedings of the 3th Marine Energy Technology Symposium, Washington D.C. (Strom, Brunton, Polagye)
2015, Jan.	SICB, West Palm Beach, FL (Eberle, Brunton, Fish, Daniel)
2014, Dec.	AGU Fall Meeting, San Francisco, CA (Polagye, Strom, Haegele, Mehta, Bowman, Brunton)
2014, Nov.	APS DFD, San Francisco, CA (Madhavan, Brunton, Riley)
2014, Nov.	APS DFD, San Francisco, CA (Parezanovic, Cordier, Noack, Spohn, Bonnet, Duriez, Segond, Abel, Brunton)
2014, Nov.	APS DFD, San Francisco, CA (Duriez, Parezanovic, von Krbek, Cordier, Noack, Bonnet, Segond, Abel, Gautier, Aider, Raibaudo, Cuvier, Stanislas, Debien, Mazellier, Kourta, Brunton)
2014, Nov.	APS DFD, San Francisco, CA (Noack, Cordier, Parezanovic, von Krbek, Segond, Abel, Brunton)
2014, Aug.	IEEE APWC, Aruba (Johnson, Brunton, Kutz, Kundtz)
2014, July	Nonlinear Photonics, Barcelona, Spain (Kutz, Fu, Brunton)
2014, June	Computational Science & Engineering (CompSE) Workshop, Aachen, Germany (Noack, Cordier, Duriez, Parezanovic, Delville, Bonnet, Segond, Abel, Morzynski, Brunton; **Keynote**)
2014, June	85th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Erlangen Nürnberg, Germany (Segond, Abel, Parezanovic, Duriez, Noack, Cordier, Bonnet, Morzynski, Brunton)
2014, June	85th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Erlangen Nürnberg, Germany (Abel, Segond, Duriez, Cordier, Parezanovic, Noack, Bonnet, Morzynski, Brunton)
2014, April	SIAM Conference on Uncertainty Quantification (Noack, Duriez, Parezanovic, Laurentie, Schliegel, Kaiser, Cordier, Spohn, Bonnet, Morzynski, Segond, Abel, Brunton; *invited*)
2014, April	SIAM Conference on Uncertainty Quantification (Kutz, Brunton; *invited*)
2013, Nov.	APS DFD (Brunton, Tu, Kutz)
2013, Nov.	APS DFD (Tu, Luchtenburg, Rowley, Brunton, Kutz)

2013, Nov.	APS DFD (Dawson, Brunton, Rowley)
2013, Nov.	APS DFD (Noack, Duriez, Cordier, Segond, Abel, Brunton, Morzynsky, Laurentie, Parezanovic, Bonnet)
2013, Sept.	BIRS: Uncovering Transport Barriers in Geophysical Flows, Banff, Canada (Rowley, Brunton, Luchtenburg, Williams)
2012, Nov.	APS DFD (Luchtenburg, Brunton, Rowley)
2012, Nov.	APS DFD (Dawson, Brunton, Rowley)
2011, Nov.	APS DFD (Brunton, Rowley)
2011, June	41st AIAA Fluid Dynamics Conference and Exhibit (Brunton, Rowley, Wiliams)
2011, Jan.	49th AIAA Aerospace Sciences Meeting and Exhibit (Brunton, Rowley)
2010, Nov.	APS DFD (Brunton, Rowley)
2010, Jan.	48th AIAA Aerospace Sciences Meeting and Exhibit (Brunton, Rowley)
2009, Nov.	APS DFD (Brunton, Rowley)
2009, June	34th IEEE Photovoltaic Specialist Conference, Philadelphia, PA (Brunton, Rowley, Kulkarni, Clarkson)
2009, April	Thousand Islands Meeting, Gananoque Canada (Brunton, Rowley)
2009, Jan.	47th AIAA Aerospace Sciences Meeting and Exhibit (Brunton, Rowley)
2008, Nov.	APS DFD (Brunton, Rowley)
2008, April	Thousand Islands Meeting, Gananoque Canada (Brunton, Rowley)
2008, Jan.	46th AIAA ASM (Brunton, Rowley, Taira, Colonius, Collins, Williams)

Patents Granted

2. J. N. Kutz, J. Grosek, **S. L. Brunton**, X. Fu, and S. Pendergrass "Using dynamic mode decomposition for real-time background/foreground separation in video,"
US Patent Number 9674406, June 6, 2017.

1. J. N. Kutz, **S. L. Brunton**, X. Fu, "Tuning multi-input complex dynamic systems using sparse representations of performance and extremum-seeking control,"
US Patent Number 9972962, May 15, 2018.

Patents Applied

2. E. J. Seibel, C. Gong, **S. L. Brunton**, N. B. Erichson, L. Trutoiu, B. T. Schowengerdt, "System and Method for Retina Template Matching in Teleophthalmology,"
US Application Number PCT/US2019/062327, November 20, 2019.

1. E. J. Seibel, **S. L. Brunton**, C. Gong, B. T. Schowengerdt, "Eye Tracking in Near-Eye Displays,"
In preparation, June 11, 2020.

Software

12. `PyKoopman`, Developed by Eurika Kaiser. [https://github.com/dynamicslab/PyKoopman/]

11. `PySensors`, Developed by Brian de Silva. [https://github.com/dynamicslab/PySensors/]

10. `PySINDy`, Developed by Brian de Silva and Kathleen Champion. [https://github.com/dynamicslab/PySINDy/]

9. `sindy-mpc`, Developed by Eurika Kaiser. [https://github.com/eurika-kaiser/SINDY-MPC/]

8. `kronic`, Developed by Eurika Kaiser. [https://github.com/eurika-kaiser/KRONIC/]

7. `deepkoopman`, Developed by Bethany Lusch. [https://github.com/BethanyL/DeepKoopman/]

6. `pde-find`, Developed by Sam Rudy. [https://github.com/snagcliffs/PDE-FIND/]

5. `sspor`, Developed by Krithika Manohar. [https://github.com/kmanohar/SSPOR_pub/]

4. `rsvd`, Developed by Ben Erichson. [github.com/erichson/rSVD/]

3. `eigenfish`, Developed by Seth Pendergrass, funded by DOE. [github.com/sethdp/eigenfish/]

2. `libssvd`, Developed by Seth Pendergrass. [github.com/sethdp/libssvd/]

1. `python-control`, led by Richard Murray. [sourceforge.net/projects/python-control/]

SERVICE

Selected Service (UW)
ME Chair search committee, 2020
ME Faculty hiring committee for QIST, 2020
eScience Education Committee (co-chair), 2017-2019
ME Qualifying exam reform committee (chair), 2016-2019
ME Faculty hiring committee, 2017-2019
ME S&D committee, 2014-2019
Wrote and evaluated ME Math Quals in Fall and Spring 2015, 2016
Served on dozens of PhD thesis committees
Mary Gates research scholarship application review, 2013
UW Hyperloop Team: Faculty advisor, 2017
UW Math Academy: Demo real-world math to high-school students from under-represented groups.
UW State Academic Red Shirt (STARS): Faculty mentor.

Selected Service (External)
Associate Director, NSF AI Institute, 2021–present
NSF CAREER Panelist, 2021
Broad Educational Outreach through YouTube (see next page)
Associate Editor, SIAM Scientific Computing (SISC), 2020–present
Guest Editor, special issue of Theor. & Comp. Fluid Dyn., invited by Tim Colonius, Senior Editor
Associate Editor for ACC (American Control conference), invited by Belinda Batten, Editor
On Advisory Committee for data analysis research PNNL
Review research papers and proposals (>200)
Outreach to underrepresented groups through STARS and Math Academy, 2014–present
Event manager, New Jersey Science Olympiad, 2009–2010
Session chair at conferences: APS DFD (2013, 2014), SIAM CSE (2013), SIAM DS (2013), SIAM CSE (2015), SIAM DS (2015), SIAM CT (2015), SIAM UQ (2016), APS DFD (2016), SIAM CSE (2017).

Selected Organized Symposia, Workshops, and Summer Schools
VKI short course – *Machine learning for fluid dynamics*
(w/ Alfonso-Mendez, Noack, Ianiro), [2020]
IPAM Long Workshop – *Learning physics and the physics of learning*
(w/ Clementi, Noe, Meila, Paesani, and Lecun), 3-month long program funded by NSF [2019]
Physics Informed Machine Learning Workshop (w/ Kutz) [2019]
Boeing Executive Data Science Workshop, Boeing Defense and Space, Washington DC, [2018]
Sparse and Compressive Sensing, w/ B Brunton, State of the Art Review, Seattle WA, [2018]
Boeing Executive Data Science Workshop, Boeing Commercial Aircraft, Seattle WA, [2018]
(Requested by CEO Kevin McAllister and 35 senior executives)
Rome Workshop & Summer School (w/ Kutz, Conti, Del Re, Gentilini, Marcucci) [2017]
Seven SIAM Minisymposia [2013-2019]

Memberships & Professional Societies
IEEE, *senior member*
SIAM, *lifetime member*
APS, *lifetime member*
AIAA, *lifetime member*, *senior member*

Video Outreach on YouTube

- $> 150,000$ Subscribers

- $8,000,000$ Views

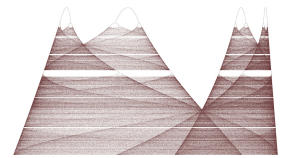- Over 100 hours of educational content, including four courses, two bootcamps, and research abstracts

Mathematical Art

"Mathematical Mountains,"
Princeton Art of Science Gallery, May 2011.
http://crispme.com/art-of-science-2011/
http://butdoesitfloat.com/Mathematical-Mountains, 2011

"Stirring Faces,"
Princeton Art of Science Gallery, May 2010.
http://phys.org/news193333630.html, May 2010.
Time Photo Essays, "Seeking Art in Science," June 2010.
http://arxiv.org/abs/1210.3747
APS DFD Gallery of Fluid Motion, 2012.
(http://www.youtube.com/watch?v=l3rtloOyh3I)
Princeton Alumni Weekly, "Science as art," April 2013.