Freddie Witherden

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Education

2012–2015 **PhD**
Department of Aeronautics, Imperial College London, UK.

2008–2012 **MSci** (Incorporating Bachelors level study)
Department of Physics, Imperial College London, UK.

Academic Positions

2019– **Assistant Professor**
Department of Ocean Engineering, Texas A&M University, USA.

2019– **Visiting Researcher**
Department of Aeronautics, Imperial College London, UK.

2016–2018 **Postdoctoral Scholar**
Department of Aeronautics & Astronautics, Stanford University, USA.

2015–2016 **Postdoctoral Scholar**
Department of Aeronautics, Imperial College London, UK.

Experience

2021– **Co-founder of Cassyni Ltd**
Co-founder and CTO of online seminar platform Cassyni.

2014– **Partner at Quadrature Solutions LLP**
Founding partner of computational science and engineering consultancy partnership Quadrature Solutions.

2016–2018 **Director of Kopernio Limited**
Co-founder and CTO of the AI technology firm Kopernio. In April 2018 Kopernio was acquired by Clarivate Analytics.

2012–2015 **Director of newsflo Ltd**
Co-founder and CTO of news analytics firm newsflo. In January of 2015 newsflo was acquired by Elsevier.

Current Funding

Principal Investigator

2023– **AFOSR YIP: Next Generation High-Order Methods for Multi-Physics Multi-Scale Problems**
Sponsor: Air Force Office of Scientific Research.

Co-Principal Investigator

2024– **Formation Mechanism of Wind Ripples**
Sponsor: National Science Foundation.

2023– **Impact of Augmented Reality Devices on Hazard Perception in Marine Environments**
Sponsor: American Bureau of Shipping.

Historical Funding

Principal Investigator

2021–2022 **DURIP: Enabling Next-Generation Heterogeneous Computing for Massively Parallel High-Order Compressible CFD**
Sponsor: Air Force Office of Scientific Research.

Co-Principal Investigator

2023–2025 **SMART-SEA: Safe Maneuvering using Augmented Radar Tracking for Sea-based Entity Avoidance**
Sponsor: Ocean Energy Safety Institute.

2020–2023 **Golf Ball Computational Fluid Dynamics**
Sponsor: Callaway Golf Company.

Publications

Published Journal Articles

50. **F. D. Witherden**, P. E. Vincent, W. Trojak, Y. Abe, A. Akbarzadeh, S. Akkurt, M. Alhawwary, L. Caros, T. Dzanic, G. Giangaspero, A. S. Iyer, A. Jameson, M. Koch, N. A. Loppi, S. Mishra, R. Modi, G. Sáez-Mischlich, J. S. Park, B. C. Vermeire, and L. Wang,
PyFR v2.0.3: Towards industrial adoption of scale-resolving simulations.
Computer Physics Communications, 311, 109567, 2025.

49. S. Akkurt, **F. D. Witherden**, and P. E. Vincent,
Cache Blocking for Flux Reconstruction: Extension to Navier-Stokes Equations and Anti-aliasing.
Computer Physics Communications, 305, 109332, 2024.

48. S. Taghizadeh, **F. D. Witherden**, and S. S. Girimaji,
Scale-resolving simulations of turbulent flows with coherent structures: Toward cut-off dependent data-driven closure modeling.
Physics of Fluids, 36, 065143, 2024.

47. S. Mishra, W. Trojak, and **F. D. Witherden**,
Online Bayesian Optimization of Polynomial-Multigrid Cycles for Flux Reconstruction.
AIAA Journal, 62(7), 2024.

46. L. Wang, **F. D. Witherden**, and A. Jameson,
An efficient GPU-based h-adaptation framework via linear trees for the flux reconstruction method.
Journal of Computational Physics, 502, 112823, 2024.

45. T. Dzanic, **F. D. Witherden**, and L. Martinelli,
Validation of wall boundary conditions for simulating complex fluid flows via the Boltzmann equation: Momentum transport and skin friction.
Physics of Fluids, 36, 017109, 2024.

44. T. Dzanic, W. Trojak, and **F. D. Witherden**,
On the Anti-Aliasing Properties of Entropy Filtering for Discontinuous Spectral Element Approximations of Under-Resolved Turbulent Flows.
International Journal of Computational Fluid Dynamics, 37, pp. 474–486, 2023.

43. T. Dzanic and **F. D. Witherden**,
Positivity-preserving entropy filtering for the ideal magnetohydrodynamics equations.
Computers & Fluids, 266, 106056, 2023.

42. T. Dzanic, **F. D. Witherden**, and L. Martinelli,
A positivity-preserving and conservative high-order flux reconstruction method for the polyatomic Boltzmann–BGK equation.
Journal of Computational Physics, 486, 112146, 2023.

41. T. Dzanic, W. Trojak, and **F. D. Witherden**,
Bounds preserving temporal integration methods for hyperbolic conservation laws.
Computers & Mathematics with Applications, 135, pp. 6–18, 2023.

40. L. Wang, W. Trojak, **F. D. Witherden**, and A. Jameson,
Nonlinear p-Multigrid Preconditioner for Implicit Time Integration of Compressible Navier–Stokes Equations with p-Adaptive Flux Reconstruction.
Journal of Scientific Computing, 93(81), 2022.

39. T. Dzanic, W. Trojak, and **F. D. Witherden**,
Utilizing time-reversibility for shock capturing in nonlinear hyperbolic conservation laws.
Computers & Fluids, 247, 105652, 2022.

38. W. Trojak, N. R. Vadlamani, J. Tyacke, **F. D. Witherden**, and A. Jameson,
Artificial compressibility approaches in flux reconstruction for incompressible viscous flow simulations.
Computers & Fluids, 247, 105634, 2022.

37. T. Dzanic and **F. D. Witherden**,
Positivity-preserving entropy-based adaptive filtering for discontinuous spectral element methods.
Journal of Computational Physics, 468, 111501, 2022.

36. M. S. Petrov, T. D. Todorov, G. S. Walters, D. M. Williams, and **F. D. Witherden**,
Enabling four-dimensional conformal hybrid meshing with cubic pyramids.
Numerical Algorithms, 91, pp. 671–709, 2022.

35. T. Dzanic, S. S. Girimaji, and **F. D. Witherden**,
Partially-Averaged Navier-Stokes Simulations of Turbulence Within a High-Order Flux Reconstruction Framework.
Journal of Computational Physics, 456, 110992, 2022.

34. W. Trojak, R. Watson, and **F. D. Witherden**,
Hyperbolic diffusion in flux reconstruction: Optimisation through kernel fusion within tensor-product elements.
Computer Physics Communications, 273, 108235, 2022.

33. S. Akkurt, **F. D. Witherden**, and P. E. Vincent,
Cache Blocking Strategies Applied to Flux Reconstruction.
Computer Physics Communications, 271, 108193, 2022.

32. G. Giangaspero, **F. D. Witherden**, and P. E. Vincent,
Synthetic Turbulence Generation for High-Order Scale-Resolving Simulations on Unstructured Grids.
AIAA Journal, 60(2), 2022.

31. S. Taghizadeh, **F. D. Witherden**, Y. A. Hassan, and S. S. Girimaji,
Turbulence closure modeling with data-driven techniques: Investigation of generalizable deep neural networks.
Physics of Fluids, 33(11), 115132, 2021.

30. **F. D. Witherden**,
Python at petascale with PyFR or: how I learned to stop worrying and love the snake.
Computers in Science & Engineering, 23(4), pp. 29–37, 2021.

29. A. S. Iyer, Y. Abe, B. C. Vermeire, P. Bechlars, R. D. Baier, A. Jameson, **F. D. Witherden**, and P. E. Vincent,
High-Order Accurate Direct Numerical Simulation of Flow over a MTU-T161 Low Pressure Turbine Blade.
Computers & Fluids, 226, 104989, 2021.

28. C. V. Frontin, G. S. Walters, **F. D. Witherden**, C. W. Lee, D. M. Williams, and D. L. Darmofal,
Foundations of space-time finite element methods: Polytopes, interpolation, and integration.
Applied Numerical Mathematics, 166, pp. 92–113, 2021.

27. W. Trojak and **F. D. Witherden**,
A New Family of Weighted One-Parameter Flux Reconstruction Schemes.
Computers & Fluids, 222, 104918, 2021.

26. C. Cox, W. Trojak, T. Dzanic, **F. D. Witherden**, and A. Jameson,
Accuracy, Stability, and Performance Comparison between the Spectral Difference and Flux Reconstruction Schemes.
Computers & Fluids, 221, 104922, 2021.

25. J. Morton, M. J. Kochenderfer, and **F. D. Witherden**,
Parameter-Conditioned Sequential Generative Modeling of Fluid Flows.
AIAA Journal, 59(3), pp. 825–841, 2021.

24. W. Trojak and **F. D. Witherden**,
Inline vector compression for computational physics.
Computer Physics Communications, 258, 107562, 2021.

23. **F. D. Witherden** and P. E. Vincent,
On nodal point sets for flux reconstruction.
Journal of Computational and Applied Mathematics, 381, 113014, 2021.

22. T. S. Fowler, IV, **F. D. Witherden**, and S. S. Girimaji,
Partially-averaged Navier–Stokes simulations of turbulent flow past a square cylinder: Comparative assessment of statistics and coherent structures at different resolutions.
Physics of Fluids, 32(12), 125106, 2020.

21. T. S. Fowler, IV, **F. D. Witherden**, and S. S. Girimaji,
Pulsating Flow Past a Square Cylinder: Analysis of Force Coefficient Spectra and Vortex-Structure Development.
Journal of Fluids Engineering, 142(12), 121106, 2020.

20. S. Taghizadeh, **F. D. Witherden**, and S. S. Girimaji,
Turbulence closure modeling with data-driven algorithms: physical compatibility and consistency considerations.
New Journal of Physics, 22, 093023, 2020.

19. J. Romero, J. Crabill, J. E. Watkins, **F. D. Witherden**, and A. Jameson,
ZEFR: A GPU-accelerated high-order solver for compressible viscous flows using the flux reconstruction method.
Computer Physics Communications, 250, 107169, 2020.

18. **F. D. Witherden** and A. Jameson,
Impact of Number Representation for High-Order Implicit Large-Eddy Simulations.
AIAA Journal, 58(1), pp. 184–197, 2020.

17. N. A. Loppi, **F. D. Witherden**, A. Jameson, and P. E. Vincent,
Locally adaptive pseudo-time stepping for high-order Flux Reconstruction.
Journal of Computational Physics, 399, 108913, 2019.

16. A. S. Iyer, **F. D. Witherden**, S. I. Chernyshenko, and P. E. Vincent,
Identifying eigenmodes of averaged small-amplitude perturbations to turbulent channel flow.
Journal of Fluid Mechanics, 875, pp. 758–780, 2019.

15. K. T. Carlberg, A. Jameson, M. J. Kochenderfer, J. Morton, L. Peng, and **F. D. Witherden**,
Recovering missing CFD data for high-order discretizations using deep neural networks and dynamics learning.
Journal of Computational Physics, 395, pp. 105–124, 2019.

14. J. A. Crabill, **F. D. Witherden**, and A. Jameson,
High-order computational fluid dynamics simulations of a spinning golf ball.
Sports Engineering, 22(9), 2019.

13. J. A. Crabill, **F. D. Witherden**, and A. Jameson,
A Parallel Direct Cut Algorithm for High-Order Overset Methods with Application to a Spinning Golf Ball.
Journal of Computational Physics, 374, pp. 692–723, 2018.

12. N. A. Loppi, **F. D. Witherden**, A. Jameson, and P. E. Vincent,
A High-Order Cross-Platform Incompressible Navier–Stokes Solver via Artificial Compressibility with Application to a Turbulent Jet.
Computer Physics Communications, 233, pp. 193–205, 2018.

11. **F. D. Witherden** and A. Jameson,
On the Spectrum of the Steger–Warming Flux Vector Splitting Scheme.
International Journal of Numerical Methods in Fluids, 87(12), pp. 601–606, 2018.

10. J. Romero, **F. D. Witherden**, and A. Jameson,
A Direct Flux Reconstruction Scheme for Advection-Diffusion Problems on Triangular Grids.
Journal of Scientific Computing, 73, pp. 1115–1144, 2017.
9. J. S. Park, **F. D. Witherden**, and P. E. Vincent,
High-Order Accurate Implicit Large Eddy Simulations of Flow over a NACA0021 Aerofoil in Deep Stall.
AIAA Journal, 55(7), pp. 2186–2197, 2017.
8. B. C. Vermeire, **F. D. Witherden**, and P. E. Vincent,
On the Utility of GPU Accelerated High-Order Methods for Unsteady Flow Simulations: A Comparison with Industry-Standard Tools.
Journal of Computational Physics, 334, pp. 497–521, 2017.
7. **F. D. Witherden**, J. S. Park, and P. E. Vincent,
An Analysis of Solution Point Coordinates for Flux Reconstruction Schemes on Tetrahedral Elements.
Journal of Scientific Computing, pp. 905–920, 69(2), 2016.
6. B. D. Wozniak, **F. D. Witherden**, F. P. Russell, P. E. Vincent, and P. H. J. Kelly,
GiMMiK—Generating bespoke matrix multiplication kernels for accelerators: Application to high-order Computational Fluid Dynamics.
Computer Physics Communications, 202, pp. 12–22, 2016.
5. **F. D. Witherden**, B. C. Vermeire, and P. E. Vincent,
Heterogeneous computing on mixed unstructured grids with PyFR.
Computers & Fluids, 120, pp. 173–186, 2015.
4. P. E. Vincent, A. M. Farrington, **F. D. Witherden**, and A. Jameson,
An extended range of stable-symmetric-conservative Flux Reconstruction correction functions.
Computer Methods in Applied Mechanics and Engineering, 296, pp. 248–272, 2015.
3. **F. D. Witherden** and P. E. Vincent,
On the Identification of Symmetric Quadrature Rules for Finite Element Methods.
Computers & Mathematics with Applications, 69(10), pp. 1232–1241, 2015.
2. **F. D. Witherden**, A. M. Farrington, and P. E. Vincent,
PyFR: An Open Source Framework for Solving Advection-Diffusion Type Problems on Streaming Architectures Using the Flux Reconstruction Approach.
Computer Physics Communications, 185(11), pp. 3028–3040, 2014.

1. **F. D. Witherden** and P. E. Vincent,
   An Analysis of Solution Point Coordinates for Flux Reconstruction Schemes on Triangular Elements.
   Journal of Scientific Computing, 61(2), pp. 398–423, 2014.

Articles in Conference Proceedings

16. S. Mishra, D. K. Chakravorty, L. M. Perez, F. Dang, H. Liu, and **F. D. Witherden**,
    Impact of Memory Bandwidth on the Performance of Accelerators.
    PEARC24, 21–25 July 2024, Providence, Rhode Island, USA.
15. S. Mishra, **F. D. Witherden**, D. K. Chakravorty, L. M. Perez, and F. Dang,
    Scaling Study of Flow Simulations on Composable Cyberinfrastructure.
    PEARC23, 23–27 July 2023, Portland, Oregon, USA.
14. A. Akbarzadeh, M. Alhawwary, **F. D. Witherden**, and A. Jameson,
    Numerical prediction of drag crisis for smooth spheres using a high-order flux reconstruction method.
    Paper AIAA 2023-2146, AIAA Scitech 2023 Forum, 23–27 January 2023, National Harbor, Maryland, USA.
13. R. Modi, M. Alhawwary, A. Akbarzadeh, **F. D. Witherden**, and A. Jameson,
    Aeroacoustics noise prediction for the airfoil-rod benchmark using high-order large eddy simulation on unstructured grids and the acoustic analogy approach in frequency-domain.
    Paper AIAA 2023-0978, AIAA Scitech 2023 Forum, 23–27 January 2023, National Harbor, Maryland, USA.
12. W. Trojak, T. Dzanic, and **F. D. Witherden**,
    Shock Capturing Methods in High-Order Flux Reconstruction I: Graph Viscosity and Convex Limiting Approaches.
    Paper AIAA 2021-0496, AIAA Scitech 2021 Forum, 11–15 and 19–21 January 2021.
11. D. W. Hartman, T. Dzanic, **F. D. Witherden**, A. Tropina, and R. B. Miles,
    Numerical analysis and prediction of Aero-optical effects.
    Paper AIAA 2021-0335, AIAA Scitech 2021 Forum, 11–15 and 19–21 January 2021.
10. T. Dzanic, K. Shah, and **F. D. Witherden**,
    Fourier Spectrum Discrepancies in Deep Network Generated Images.
    NeurIPS 2020, 6–12 December 2020.

9. Y. Abe, **F. D. Witherden**, G. Giangaspero, B. C. Vermeire, A. S. Iyer, and P. E. Vincent,
   High-performance Implementation of Inlet Turbulence Generation for GPU-based Parallel Computation.
   Advanced Fluid Information 2019, 6–8 November 2019, Sendai, Miyagi, JP.
8. J. Morton, **F. D. Witherden**, and M. J. Kochenderfer,
   Deep Variational Koopman Models: Inferring Koopman Observations for Uncertainty-Aware Dynamics Modeling and Control.
   IJCAI-19, 10–16 August 2019, Macao, PRC.
7. J. Morton, **F. D. Witherden**, A. Jameson, and M. J. Kochenderfer,
   Deep Dynamical Modeling and Control of Unsteady Fluid Flows.
   NeurIPS 2018, 2–8 December 2018, Montréal, Quebec, CA.
6. **F. D. Witherden** and A. Jameson,
   Future Directions of Computational Fluid Dynamics.
   Paper AIAA 2017-3791, 23rd AIAA Computational Fluid Dynamics Conference, 5–9 June 2017, Denver, Colorado, USA.
5. P. E. Vincent, **F. D. Witherden**, B. C. Vermeire, J. S. Park, and A. S. Iyer,
   Towards Green Aviation with Python at Petascale.
   ACM Gordon Bell Finalist and Best Paper Finalist. Article 1. SC16, 13–18 November 2016, Salt Lake City, Utah, USA.
4. M. Klemm, **F. D. Witherden**, and P. E. Vincent,
   Using the pyMIC Offload Module in PyFR.
   Proceedings of EuroSciPy 2015.
3. B. C. Vermeire, **F. D. Witherden**, and P. E. Vincent,
   On the Utility of High-Order Methods for Unstructured Grids: A Comparison Between PyFR and Industry Standard Tools.
   Paper AIAA 2015-2743, 22nd AIAA Computational Fluid Dynamics Conference, 22–26 June 2015, Dallas, Texas, USA.
2. P. E. Vincent, **F. D. Witherden**, A. M. Farrington, G. Ntemos, B. C. Vermeire, J. S. Park, and A. S. Iyer,
   PyFR: Next-Generation High-Order Computational Fluid Dynamics on Many-Core Hardware.
   Paper AIAA 2015-3050, 22nd AIAA Computational Fluid Dynamics Conference, 22–26 June 2015, Dallas, Texas, USA.

1. G. Mengaldo, D. De Grazia, J. Peiro, A. Farrington, **F. D. Witherden**, P. E. Vincent, and S. J. Sherwin,
   A Guide to the Implementation of Boundary Conditions in Compact High-Order Methods for Compressible Aerodynamics.
   Paper AIAA 2014-2923, 7th AIAA Theoretical Fluid Mechanics Conference, 16–20 June 2014, Atlanta, Georgia, USA.

Book Chapters

6. M. Rasquin, K. Hillewaert, A. Colombo, F. Bassi, F. Massa, K. Puri, A. S. Iyer, Y. Abe, **F. D. Witherden**, B. C. Vermeire, and P. E. Vincent,
   Computational Campaign on the MTU T161 Cascade.
   In TILDA: Towards Industrial LES/DNS in Aeronautics, edited by C. Hirsch, K. Hillewaert, R. Hartmann, V. Couaillier, J-F. Boussuge, F. Chalot, S. Bosniakov, and W. Haase. Springer, 2021.
5. F. Bassi, L. Botti, L. Verzeroli, R. Hartmann, J. Jägersküpper, E. Martin, M. Lorteau, P. E. Vincent, **F. D. Witherden**, B. C. Vermeire, J. S. Park, A. Iyer, K. Puri, D. Gutzwiller, C. Hirsch, and F. Chalot,
   Parallelisation to Several Tens-of-Thousands of Cores.
   In TILDA: Towards Industrial LES/DNS in Aeronautics, edited by C. Hirsch, K. Hillewaert, R. Hartmann, V. Couaillier, J-F. Boussuge, F. Chalot, S. Bosniakov, and W. Haase. Springer, 2021.
4. **F. D. Witherden** and A. Jameson,
   Aerodynamics.
   In Encyclopedia of Computational Mechanics Second Edition, edited by E. Stein, R. de Borst, and T. J. R. Hughes. Wiley, 2017.
3. **F. D. Witherden**, A. Jameson, and D. W. Zingg,
   The Design of Steady State Schemes for Computational Aerodynamics.
   In Handbook of Numerical Analysis XVIII: Handbook of Numerical Methods for Hyperbolic Problems: Applied and Modern Issues, pp. 303–349, edited by R. Abgrall and C-W. Shu. Elsevier, 2017.
2. **F. D. Witherden**, P. E. Vincent, and A. Jameson,
   High-Order Flux Reconstruction Schemes.
   In Handbook of Numerical Analysis XVII: Handbook of Numerical Methods for Hyperbolic Problems, pp. 227–263, edited by R. Abgrall and C-W. Shu. Elsevier, 2016.
1. J. Enkovaara, M. Klemm, and **F. D. Witherden**,
   High Performance Python Offloading.
   In High Performance Parallelism Pearls Volume 2, pp. 246–269, edited by J. Jeffers and J. Reinders. Morgan Kaufmann, 2015.

Patents

1. B. Kaube, J. Reichelt, P. E. Vincent, and **F. D. Witherden**,
   Retrieving digital content over a network.
   US patent 11,005,851, 2021.

Posters

6. A. Deng, Y. Sun, M. Fürth, B. Windén, **F. D. Witherden**, and R. J. Vechan,
   The Application of Augmented Radar Tracking and High-fidelity Maneuvering Models for Marine Collision Avoidance.
   29th SNAME Offshore Symposium, 20 February 2024, Houston, Texas, USA.
5. T. Dzanic, K. Shah, and **F. D. Witherden**,
   Fourier Spectrum Discrepancies in Deep Network Generated Images.
   NeurIPS 2020, 6–12 December 2020.
4. N. A. Loppi, **F. D. Witherden**, and P. E. Vincent,
   A High-order Cross-platform Incompressible Navier-Stokes Solver via Artificial Compressibility with Application to Submarine Hydrodynamics.
   SIAM CSE19, 25–1 March 2019, Spokane, Washington, USA.
3. J. Morton, **F. D. Witherden**, A. Jameson, and M. J. Kochenderfer,
   Deep Dynamical Modeling and Control of Unsteady Fluid Flows.
   NeurIPS 2018, 2–8 December 2018, Montréal, Quebec, CA.
2. **F. D. Witherden**, B. D. Wozniak, F. P. Russell, P. E. Vincent, and P. H. J. Kelly,
   Beating cuBLAS: Automatically Generating Bespoke Matrix Multiplication Kernels Using GiMMiK.
   SC15, 15–20 November 2015, Austin, Texas, USA.
1. **F. D. Witherden**, B. C. Vermeire, and P. E. Vincent,
   PyFR: An Open Source Python Framework for High-Order CFD on Heterogeneous Platforms.
   SC14, 16–21 November 2014, New Orleans, Louisiana, USA.

Mentoring

Postdoc Mentoring

2024– Kyle Schau, Department of Aerospace Engineering, Texas A&M University (Co-advised with A. Jameson).

2021–2023 Amir Akbarzadeh, Department of Aerospace Engineering, Texas A&M University (Co-advised with A. Jameson).

2021–2022 Mohammad Alhawwary, Department of Aerospace Engineering, Texas A&M University (Co-advised with A. Jameson).

2020–2021 Lai Wang, Department of Aerospace Engineering, Texas A&M University (Co-advised with A. Jameson).

2019–2021 Will Trojak, Department of Ocean Engineering, Texas A&M University.

Doctoral Students Supervised

2025– Hossein Mirzakhani, Department of Ocean Engineering, Texas A&M University (Co-advised with O. Durán Vinent).

2021– Rishit Modi, Department of Ocean Engineering, Texas A&M University (Co-advised with A. Jameson).

2020– Sambit Mishra, Department of Ocean Engineering, Texas A&M University.

2019–2023 Tarik Dzanic, Department of Ocean Engineering, Texas A&M University.

2018–2022 Semih Akkurt, Department of Aeronautics, Imperial College London (Co-advised with P. E. Vincent).

Masters Students Supervised

2020–2021 Jason Stanley, Department of Ocean Engineering, Texas A&M University.

PhD Thesis Committees

2025 Omar Sallam, Department of Ocean Engineering, Texas A&M University.

2024 Sagar Pokharel, Department of Aerospace Engineering, Texas A&M University.

2023 Salar Taghizadeh, Department of Mechanical Engineering, Texas A&M University.

2023 Tarik Dzanic, Department of Ocean Engineering, Texas A&M University.

2023 Shugo Date, Graduate School of Engineering, Tohoku University.

2022 Byungho Kang, Department of Ocean Engineering, Texas A&M University.

2022 Andrew Riha, Department of Aerospace Engineering, Texas A&M University.

2022 Mark Lohry, Department of Mechanical and Aerospace Engineering, Princeton University.

2021 Chetna Kamble, Department of Ocean Engineering, Texas A&M University.

2021 Muhao Chen, Department of Aerospace Engineering, Texas A&M University.

2020 Thomas Fowler, Department of Aerospace Engineering, Texas A&M University.

2020 Ezhilmathi Krishnasamy, Basque Center for Applied Mathematics, University of the Basque Country.

2020 Mohammadali Hedayat, Department of Mechanical Engineering, Texas A&M University.

2019 Jeremy Morton, Department of Aeronautics & Astronautics, Stanford University.

Teaching

Teaching at Texas A&M

2022– OCEN 652: Introduction to Numerical Methods.

2021– OCEN 361: Applied Numerical Methods with Python.

2019–2021 OCEN 689: Special topics: Introduction to Numerical Methods.

2020 OCEN 261: Applied Numerical Methods with Python.

Teaching at Tohoku University

2022– Special Lecture series on System Integration 1: Unsteady CFD.

Teaching at Stanford

2017 CME 207: Introduction to Numerical Methods.

2017 XCME 009: Introduction to Python.

Professional

Memberships

Fellow of the Royal Aeronautical Society.

American Institute of Aeronautics and Astronautics.

Society for Industrial and Applied Mathematics.

Service

2023– Speciality editor for Computer Physics Communications.

Co-organizer of minisymposiums at: USNCCM (2017) • SIAM CSE (2019) • WCCM-ECCOMAS (2020) • WCCM-APCOM (2022) • ICFD (2023, 2024).

Served on programme committees for: IEEE Cluster conference (2018, 2019) • International Conference on Parallel Processing (2019).

Served on NSF review panels for: Combustion and Fire Systems (2020).

Reviewed for: AIAA Journal • Applied Thermal Engineering • Cell Reports Physical Science • Communications in Computational Physics • Communications in Nonlinear Science and Numerical Simulation • Communications on Applied Mathematics and Computation • Computer Methods in Applied Mechanics and Engineering • Computer Physics Communications • Computing in Science and Engineering • International Communications in Heat and Mass Transfer • International Journal for Numerical Methods in Fluids • International Journal of High Performance Computing Applications • Journal of Computational Physics • Journal of Computational and Applied Mathematics • Journal of Open Source Software • Journal of Scientific Computing • Journal of Turbulence • Mathematics and Computers in Simulation • Monthly Notices of the Royal Astronomical Society • Physics of Fluids • Proceedings of the Royal Society A • SIAM Journal on Scientific Computing.

Service at Texas A&M

2020– Department representative on the Engineering Faculty Advisory Council.

2019– Track coordinator for the Ocean Engineering honours program.

Achievements

2024 TEES Young Faculty Fellow award.

2020 Forbes 30 under 30 Europe class of 2020.

2016 ACM Gordon Bell Prize finalist.

2010 Dr Richard Learner Prize for the top student in second year Physics laboratory.