

# Freddie Witherden

*MSci ARCS PhD DIC FRAeS*

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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.

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## 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.

- 2023– **SMART-SEA: Safe Maneuvering using Augmented Radar Tracking for Sea-based Entity Avoidance.**

Sponsor: Ocean Energy Safety Institute.

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## 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

- 2020–2023 **Golf Ball Computational Fluid Dynamics.**

Sponsor: Callaway Golf Company.

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## Publications

### Published Journal Articles

45. 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, 112823, 2024.
44. 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.

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, 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. Bechlers, 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(2–3), 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

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

- 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

- 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

- 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.

### 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).

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 • SIAM Journal on Scientific Computing • Journal of Scientific Computing • Journal of Computational Physics • Computer Physics Communications • Communications in Computational Physics • International Journal of High Performance Computing Applications • Computer Methods in Applied Mechanics and Engineering • Journal of Computational and Applied Mathematics • International Journal for Numerical Methods in Fluids • Computing in Science and Engineering • Physics of Fluids • Journal of Open Source Software • Proceedings of the Royal Society A • Monthly Notices of the Royal Astronomical Society • Journal of Turbulence.

#### [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.