Jan S. Hesthaven

Vice President of Academic Affairs and Provost
Chair of Computational Mathematics and Simulation Science
Professor of Mathematics

Education

1991 **M.Sc. in Computational Physics**, *Technical University of Denmark, Denmark*, Thesis: *Dynamics of Coherent Structures in the Hasegawa-Mima Equation*.

1995 **Ph.D. in Applied Mathematics**, *Technical University of Denmark, Denmark*, Thesis: *Numerical Studies of Unsteady Coherent Structures and Transport in Two-Dimensional Flows*, ISSN: 0106-2840.

2009 **Dr.techn. in Numerical Analysis**, *Technical University of Denmark, Denmark*, Thesis: *Nodal Discontinuous Element Methods: Formulations, Analysis, and Applications*, ISBN: 978-87-643-0562-3.

Professional experience

Academic and leadership appointments

1995-1998 **NSF postdoctoral fellow**, *Division of Applied Mathematics*, Brown University, USA.

1995-1999 **Visiting Assistant Professor**, *Division of Applied Mathematics*, Brown University, USA.

1999-2002 **Assistant Professor of Applied Mathematics**, *Division of Applied Mathematics*, Brown University, USA.

2001-2002 **Manning Assistant Professor**, *Division of Applied Mathematics*, Brown University, USA.

2003-2005 **Associate Professor of Applied Mathematics with tenure**, *Division of Applied Mathematics*, Brown University, USA.

2006-2010 **Associate Chair of Applied Mathematics**, *Division of Applied Mathematics*, Brown University, USA.

2005-2013 **Professor of Applied Mathematics**, *Division of Applied Mathematics*, Brown University, USA.

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2006-2013 **Founding director**, *Center for Computation and Visualization (CCV)*, Brown University, USA.

2010-2013 **Founding deputy director**, *The Institute for Computational and Experimental Research in Mathematics (ICERM)*, Brown University, USA.

2013-2016 **Adjunct Professor of Applied Mathematics**, *Division of Applied Mathematics*, Brown University, USA.

2014-2017 **President**, *Center of Advanced Modeling Science (CADMOS)*, Switzerland.

2014-2020 **Founding academic director**, *Scientific IT and Application Support (SCITAS)*, EPFL, Switzerland.

2017-2020 **Dean**, *School of Basic Sciences*, EPFL, Switzerland.

2007- **Professor (honorary)**, *Technical University of Denmark*, Denmark.

2013- **Professor of Mathematics**, *EPFL*, Switzerland.

2013- **Chair of Computational Mathematics and Simulation Science (MCSS)**, *EPFL*, Switzerland.

2021- **Vice President of Academic Affairs and Provost**, EPFL, Switzerland.

Governing boards - serving ad personam

2020- *Governing Board*, University of Copenhagen, Denmark.

2021- *Board of Trustees*, SIAM Publishing, USA.

2021- *Board of Directors*, EBRAINS, Europe

2021- *Governing Board*, Euresearch, Switzerland

2021- *Governing Board*, EuroTech, Europe

2021- *Governing Board*, IDIAP, Switzerland

2021- *Governing Board*, Swiss Data Science Center, Switzerland

Scientific advisory boards - serving ad personam

2012-2016 *Center for Uncertainty Quantification in Computational Science & Engineering*, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

2015-2017 *SIAM CSE activity group on Computational Science and Engineering* (elected), SIAM Publishing, USA.

2015-2018 *Erhversforskerudvalget*, Ministry of Higher Education and Science, Denmark.

2017-2019 *Energy Oriented Center of Excellence (EoCoE)*, Paris, France.

2021- *EXC SimTech Advisory Board*, University of Stuttgart, Germany.

Visiting appointments >1 month

1989 **Visiting Student**, *Joint European Torus (JET)*, Culham Center for Fusion Energy, Culham Science Centre, Abingdon, UK.

1993-1994 **Visiting Student**, *Division of Applied Mathematics*, Brown University, USA.

1994 **Visiting Student**, *Department of Mathematics and Statistics*, University of New Mexico, USA.

2001 **Visiting Professor**, *Department of Mathematical Modeling*, Technical University of Denmark, Denmark.

2004 **Visiting scientist**, *Project ONDES*, INRIA-Roquencourt, France.

2005 **Visiting scientist**, *Project ONDES*, INRIA-Roquencourt, France.

2007 **Visiting Professor**, *Department of Mathematical Modeling*, Technical University of Denmark, Denmark.

2017 **Visiting Professor**, *Department of Mathematics*, Chinese University of Hong Kong, Hong Kong.

Awards

1995 **NSF Postdoctoral Fellowship**, *Advanced Scientific Computing*, National Science Foundation, USA.

1999 **Journal of Computational Physics Outstanding Reviewer Award**.

2000 **Alfred P. Sloan Research Fellowship**, *Alfred P. Sloan Foundation*, USA.

2001 **Manning Assistant Professorship**, *Brown University*, USA.

2002 **NSF CAREER Award**, *Division of Mathematical Sciences*, National Science Foundation, USA.

2004 **Philip J. Bray Award for Teaching Excellence in the Physical Sciences for 2004-2005**, *Brown University*, USA.

2004 **Master of the Arts, Ad Eundum**, *Brown University*, USA.

2005 **Otto Mønsted Visiting Professor**, *Technical University of Denmark*, Denmark.

2012 **Gutenberg Chair**, *Gutenberg Foundation*, Strasbourg, France, (declined).

2014 **SIAM Fellow**, *Society of Applied and Industrial Mathematics (SIAM)*, Philadelphia, USA.

2022 **ICM Invited Speaker**, *International Congress of Mathematicians*, St. Petersburg, Russia.

2022 **Fellow**, *Royal Danish Academy of Sciences and Letters*, Copenhagen, Denmark.

2022 **AMS Fellow**, *American Mathematical Society*, Providence, USA.

2023 **Member of Academia Europaea**, *University of London*, London, United Kingdom.

2024 **Dr.techn. honoris causa (Dr.h.c.)**, *Technical University of Denmark*, Lyngby, Denmark.

Publications

Online collections and metrics

- MathSciNet (login required)
- Web of Science (login required)
- Google Scholar
- ResearchGate

Monographs

2007 **J. S. Hesthaven, S. Gottlieb, and D. Gottlieb**, *Spectral Methods for Time-Dependent Problems*, Cambridge Monographs on Applied and Computational Mathematics **21**. Cambridge University Press, Cambridge, UK, X+274 pages.

2008 **J. S. Hesthaven and T. Warburton**, *Nodal Discontinuous Galerkin Methods: Algorithms, Analysis, and Applications*, Springer Texts in Applied Mathematics **54**, Springer Verlag, New York, USA, XIV+500 pages.

2011 **J. S. Hesthaven and T. Warburton**, *Nodal Discontinuous Galerkin Methods: Algorithms, Analysis, and Applications*, Translation to Chinese by Jichun Li, Global Science Press, Hong Kong, 432 pages.

2013 **S. Chun and J. S. Hesthaven**, *High-order accurate methods for solving Maxwell's equations: Applications to photonic crystals and thin layer coatings*, Scholar-Press, Saarbrucken, Germany, 116 pages.

2016 **J. S. Hesthaven, G. Rozza, and B. Stamm**, *Certified Reduced Basis Methods for Parametrized Partial Differential Equations*, Springer Brief in Mathematics, Springer Verlag, Berlin, Germany, 131 pages.

2018 **J. S. Hesthaven**, *Numerical Methods for Conservation Laws: From Analysis to Algorithms*, Computational Science and Engineering **18**, SIAM Publications, Philadelphia, USA, XVI+570 pages.

Editorial works

2000 **J. S. Hesthaven, D. Gottlieb, and E. Turkel (Eds.)**, *Proceedings of the 4th International Conference on Spectral and High-Order Methods (ICOSAHOM'98)*, Applied Numerical Mathematics, **33**(1-4).

2005 **M.H. Carpenter, D. Gottlieb, J. S. Hesthaven, and C.-W. Shu (Eds.)**, *Proceedings of AFOSR Workshop on Advances and Challenges in Time-Integration of PDE's*, J. Sci. Comput. **25**(1-2).

2006 **D. Gottlieb, J. S. Hesthaven, G. E. Karniadakis, and C.-W. Shu (Eds.)**, *Proceedings of the 6th International Conference on Spectral and High-Order Methods (ICOSAHOM'04)*, J. Sci. Comput. **27**(1-3).

2007 **G.E. Karniadakis and J.S. Hesthaven (Eds.)**, *Special Issue on "Spectral Interpolation in Non-Orthogonal Domains: Algorithms and Applications*, J. Engin. Math. **56**(3).

H. Haddar and J.S. Hesthaven (Eds.), *Proceedings of the 7th International Conference on Mathematical and Numerical Aspects of Waves (WAVES'05)*, J. Comp. Appl. Math. **204**(2).

2010 **J. S. Hesthaven and E. Rønquist (Eds)**, *Spectral and High-Order Methods for Partial Differential Equations ICOSAHOM 2009*, Springer Lecture Notes in Computational Science and Engineering **76**, Springer Verlag, Berlin, Germany, XI+510 pages.

2012 **J.S. Hesthaven and E. Tadmor (Eds.)**, *Special Issue in Memory of Professor David Gottlieb*, Math. Model. Numer. Anal. **46**.

2014 **M. Azaiez, H. El Fekih, and J. S. Hesthaven (Eds)**, *Spectral and High-Order Methods for Partial Differential Equations ICOSAHOM 2012*, Springer Lecture Notes in Computational Science and Engineering **95**, Springer Verlag, Berlin, Germany, IX+425 pages.

2015 **M. Kirby, M. Brezin, and J. S. Hesthaven (Eds)**, *Spectral and High-Order Methods for Partial Differential Equations ICOSAHOM 2014*, Springer Lecture Notes in Computational Science and Engineering **106**, XI+522 pages.

G.E. Karniadakis, J.S. Hesthaven, and I. Podlubny (Eds.), *Special Issue on Fractional PDEs: Theory, Numerics and Applications*, J. Comput. Phys. **293**.

J.H. Jung, L. Krivodonova, A. Tesdale, and J.S. Hesthaven (Eds.), *Recent progress in hyperbolic problems: Theory and computation*, J. Sci. Comput. **64**(3).

2017 **M. Bittencourt, N. Dumont, and J. S. Hesthaven (Eds)**, *Spectral and High-Order Methods for Partial Differential Equations ICOSAHOM 2016*, Springer Lecture Notes in Computational Science and Engineering **119**, Springer Verlag, Berlin, Germany, XI+692 pages.

2019 **Q. Du, J. S. Hesthaven, C. Li, C.-W. Shu (Eds.)**, *Focused Issue on Fractional Derivatives and General Nonlocal Models*, Comm. Appl. Math. Comput. **1**(4).

G. Karniadakis and J.S. Hesthaven (Eds.), *Deep Learning for Physical Systems*, J. Comput. Phys. **394**.

2022 **J.S. Hesthaven, J. K. Ryan, C.-W. Shu, J. van der Vegt, Y. Xu, Q. Zhang and Z. Zhang (Eds.)**, *Discontinuous Galerkin Methods*, Comm. Appl. Math. Comput. **4**, 759-1010.

2023 **S. Gottlieb, J.S. Hesthaven, S. Osher, J. Qiu, C.-W. Shu, Q. Zhang, and Y.-T. Zhang (Eds.)**, *WENO Schemes*, Comm. Appl. Math. Comput. **5**.

To appear **W. Cai W.E J.S. Hesthaven, D. Xiu, and L. Ying (Eds.)**, *Deep Neural Network Machine Learning for Scientific Computing*, Comm. Appl. Math. Comput..

Book chapters

2003 **J. S. Hesthaven**, *High-Order Accurate Methods in Time-Domain Computational Electromagnetics. A Review*, Advances in Imaging and Electron Physics **127**, 59-123.

2011 **A. Klöckner, T. Warburton and J.S. Hesthaven**, *Solving Wave Equations on Unstructured Geometries*, GPU Computing Gems **2**, 225-242.

2012 **A. Klöeckner, T. Warburton, and J.S. Hesthaven**, *High-order discontinuous Galerkin methods for GPU metaprogramming*, In GPU Solutions to Multi-Scale Problems in Science and Engineering, Lecture Notes in Earth System Sciences Series, D. Yuen, J. Wang, L. Johnson, C.-H. Chi and Y. Shi (Eds), Springer, 349-370.

2013 **F. Chen, J. S. Hesthaven and X. Zhu. 2013**, *On the use of reduced basis methods to accelerate and stabilize the Parareal method*, In Reduced Order Methods for modeling and computational reduction, Modeling, Simulation and Applications **9**, Springer Verlag, 187-214.

2016 **J.S. Hesthaven**, *Spectral Methods for Hyperbolic Problems*, In Handbook of Numerical Methods for Hyperbolic Problems Basic and Fundamental Issues, p. 441-466, Handbook of Numerical Analysis **17**, 441-466.

2020 **B. Maboudi Afkham, N. Ripamonti, Q. Wang and J.S. Hesthaven**, *Conservative Model Order Reduction for Fluid Flows*, In Quantification of Uncertainty: Improving Efficiency and Technology, Lecture Notes in Computational Science and Engineering **137**, Springer Verlag, 67-99.

2021 **C. Bigoni, M. Guo and J.S. Hesthaven**, *Predictive monitoring of large-scale engineering assets using machine learning techniques and reduced order modeling*, In Structural Health Monitoring Based on Data Science Techniques, Springer Verlag, 185-205.

2022 **J.S. Hesthaven, C. Pagliantini, and G. Rozza**, *Reduced Basis Methods for Time-Dependent Problems*, In Acta Numerica **31**, 265-345.

2023 **J.S. Hesthaven, C. Pagliantini, and G. Rozza**, *Structure-Preserving Model Order Reduction of Hamiltonian Systems*, In International Congress of Mathematics **8**, 5072-5097..

Journal publications

1992 **J. Du Croz, J. S. Hesthaven, and J. Waśniewski**, *Comparison of Two FFT Libraries on the Amdahl/Fujitsu VP Computer - NAG and Siemens Libraries*, Supercomputer **9**(5), 31-37..

1993 **J. S. Hesthaven, J. Nycander, and J. P. Lynov**, *Dynamics of Non-Stationary Dipole Vortices*, Phys. Fluids A **5**(3), 622-629.

J. S. Hesthaven, J. P. Lynov, J. Juul Rasmussen, and G. G. Sutyrin, *Generation of Tri-Polar Vortices on the Beta-Plane*, Phys. Fluids A **5**(7), 1674-1678.

1994 **G. G. Sutyrin, J. S. Hesthaven, J. P. Lynov, and J. Juul Rasmussen**, *Dynamical Properties of Vortical Structures on the Beta-Plane*, J. Fluid Mech. **268**, 303-331.

J. Juul Rasmussen, J. P. Lynov, J. S. Hesthaven, and G. G. Sutyrin, *Vortex Dynamics in Plasmas and Fluids*, Plasma Phys. Control. Fusion **36**, B193-B202.

1995 **J. S. Hesthaven, A. H. Nielsen, H. L. Pécseli, and J. Juul Rasmussen**, *The Eulerian-Lagrangian Transformation in Two-Dimensional Random Flows*, J. Atmos. Terres. Phys. **57**(3), 215-223.

J. S. Hesthaven, J. P. Lynov, A. H. Nielsen, J. Juul Rasmussen, M.R. Schmidt, E.G. Shapiro, and S.K. Turitsyn, *Dynamics of a Non-Linear Dipole Vortex*, Phys. Fluids A **7**(9), 2220-2229.

1996 **J. Juul Rasmussen, J. S. Hesthaven, J. P. Lynov, A. H. Nielsen, and M. R. Schmidt**, *Dipolar Vortices in Two-Dimensional Flows*, Math. Comp. Simu., **40**, 207-221.

J. S. Hesthaven and D. Gottlieb, *A Stable Penalty Method for the Compressible Navier-Stokes Equations. I. Open Boundary Conditions*, SIAM J. Sci. Comp. **17**(3), 579-612.

1997 **J. S. Hesthaven**, *A Stable Penalty Method for the Compressible Navier-Stokes Equations. II. One-Dimensional Domain Decomposition Schemes*, SIAM J. Sci. Comp. **18**(3), 658-685.

B. Yang, D. Gottlieb, and J. S. Hesthaven, *Spectral Simulation of Electromagnetic Wave Scattering*, J. Comput. Phys. **134**(2), 216-230.

J. S. Hesthaven, J. Juul Rasmussen, L. Bergé, and J. Wyller, *Numerical Studies of Localized Wave Fields Govenered by the Raman-Extended Derivative Nonlinear Schrödinger Equation*, J. Phys. A: Math. Gen. **30**, 8207-8224.

1998 **J. S. Hesthaven**, *From Electrostatics to Almost Optimal Nodal Sets for Polynomial Interpolation in a Simplex*, SIAM J. Numer. Anal. **35**(2), 655-676.

J. S. Hesthaven, *Integration Preconditioning of Pseudospectral Operators. I. Basic Linear Operators*, SIAM J. Numer. Anal. **35**(2), 1571-1593.

J. S. Hesthaven, *On the Analysis and Construction of Perfectly Matched Layers for the Linearized Euler Equations*, , J. Comput. Phys. **142**, 129-147.

J. S. Hesthaven and L. Jameson, *A Wavelet Optimized Adaptive Multi-Domain Method*, J. Comput. Phys. **145**, 280-296.

1999 **J. S. Hesthaven**, *A Stable Penalty Method for the Compressible Navier-Stokes Equations. III. Multi Dimensional Domain Decomposition Schemes*, SIAM J. Sci. Comp. **20**(1), 62-93.

B. Yang and J. S. Hesthaven, *A Pseudospectral Method for Time-Domain Computation of Electromagnetic Scattering by Bodies of Revolution*, IEEE Trans. Antennas Propaga. **47**(1), 132-141.

P. G. Dinesen, J. S. Hesthaven, J. P. Lynov, and L. Lading, *Pseudospectral Method for the Analysis of Diffractive Optical Elements*, J. Opt. Soc. Am. A **16**(5), 1124-1130.

J. S. Hesthaven and D. Gottlieb, *Stable Spectral Methods for Conservation Laws on Triangles with Unstructured Grids*, Comput. Methods Appl. Mech. Engin. **175**, 361-381.

S. Abarbanel, D. Gottlieb, and J. S. Hesthaven, *Wellposed Perfectly Matched Layers for Advective Acoustics*, J. Comput. Phys **154**(2), 266-283.

J. S. Hesthaven, P. G. Dinesen, and J. P. Lynov, *Spectral Collocation Time-Domain Modeling of Diffractive Optical Elements*, J. Comput. Phys. **155**(1), 287-306.

2000 **P. G. Dinesen, J. S. Hesthaven, and J. P. Lynov**, *A Pseudospectral Collocation Time-Domain Method for Diffractive Optics*, Appl. Numer. Math. **33**(1-4), 199-206.

B. Yang and J. S. Hesthaven, *Multidomain Pseudospectral Computation of Maxwell's Equations in 3-D General Curvilinear Coordinates*, Appl. Numer. Math. **33**(1-4), 281-289.

J. S. Hesthaven, *Spectral Penalty Methods*, Appl. Numer. Math. **33**(1-4), 23-41.

P. G. Dinesen and J. S. Hesthaven, *A Fast and Accurate Boundary Variation Method for Diffractive Gratings*, J. Opt. Soc. Am. A **17**(9), 1565-1572.

J. S. Hesthaven and C. H. Teng, *Stable Spectral Methods on Tetrahedral Elements*, SIAM J. Sci. Comput. **21**(6), 2352-2380.

V. Zharnitsky, E. Grenier, S. K. Turitsyn, C. K. R. T. Jones, and J. S. Hesthaven, *Ground States of Dispersion Managed NLS*, Phys. Rev. E. **62**(5), 7358-7364.

T. Warburton, L. Pavarino, and J. S. Hesthaven, *A Pseudospectral Scheme for Incompressible Navier-Stokes using Unstructured Nodal Elements*, J. Comput. Phys. **164**(1), 1-21.

2001 **D. Gottlieb and J. S. Hesthaven**, *Spectral Methods for Hyperbolic Problems*, J. Comput. Appl. Math. **128**(1-2), 83-131.

K. H. Dridi, J. S. Hesthaven, and A. Ditkowski, *Staircase Free Finite-Difference Time-Domain Formulation for General Materials in Complex Geometries*, IEEE Trans. Antennas Propaga. **49**(5), 749-756.

A. Ditkowski, K. H. Dridi, and J. S. Hesthaven, *Convergent Cartesian Grid Methods for Maxwells Equations in Complex Geometries*, J. Comput. Phys. **170**, 39-80.

I. Fatkullin and J. S. Hesthaven, *Adaptive High-Order Finite-Difference Method for Nonlinear Wave Problems*, J. Sci. Comput. **16**(1), 47-67.

P. G. Dinesen and J. S. Hesthaven, *A Fast and Accurate Boundary Variation Method for Diffractive Gratings. II. The Three-Dimensional Vectorial Case*, J. Opt. Soc. Am. A **18**(11), 2876-2885.

2002 **S. Abarbanel, D. Gottlieb, and J. S. Hesthaven**, *Long Time Behavior of the Perfectly Matched Layer Equations in Computational Electromagnetics*, J. Sci. Comput. **17**(1-4), 405-422.

G. X. Fan, Q. H. Liu, and J. S. Hesthaven, *Multi-Domain Pseudospectral Time-Domain Simulations of Scattering by Objects Buried in Lossy Media*, IEEE Trans. Geosci. Remote Sens. **40**(6), 1366-1373.

J. S. Hesthaven and T. Warburton, *High-Order Nodal Methods on Unstructured Grids. I. Time-Domain Solution of Maxwell's Equations*, J. Comput. Phys. **181**(1), 186-221.

F. X. Giraldo, J. S. Hesthaven, and T. Warburton, *Nodal High-Order Discontinuous Galerkin Method for the Spherical Shallow Water Equations*, J. Comput. Phys. **181**(2), 499-525.

S. A. Nielsen, J. S. Hesthaven, *A Multi-Domain Chebyshev Collocation Method for Predicting Ultrasonic Field Parameters in Complex Material Geometries*, Ultrasonics **40**(1-8), 177-180.

2003 **T. Warburton and J. S. Hesthaven**, *On the Constants in hp-Finite Element Trace Inequalities*, Comput. Methods Appl. Mech. Engin. **192**, 2765-2773.

2004 **L. Wilcox, P. G. Dinesen, and J. S. Hesthaven**, *Fast and Accurate Boundary Variation Method for Multilayered Diffraction Optics*, J. Opt. Soc. Ame. A **21**(5), 757-769.

J. S. Hesthaven and T. Warburton, *High-Order Accurate Methods for Time-domain Electromagnetics*, Comp. Mod. Engin. Sci. **5**(5), 395–408.

J.S. Hesthaven and T. Warburton, *High Order Nodal Discontinuous Galerkin Methods for the Maxwell Eigenvalue Problem*, Royal Soc. London Ser A **362**, 493–524.

J. S. Hesthaven and T. Warburton, *Discontinuous Galerkin Methods for the Time-Domain Maxwell's Equations: An Introduction*, ACES Newsletter **19**(1), 10-29.

2005 **P.J. Diamessis, J.A. Domaradzki, and J.S. Hesthaven**, *A Spectral Multidomain Penalty Method Model for the Simulation of High Reynolds Number Localized Incompressible Stratified Turbulence*, J. Comput. Phys **202**, 298-322.

Q. Y. Chen, D. Gottlieb, and J. S. Hesthaven, *Uncertainty Analysis for Steady-State Inviscid Burgers Equation*, J. Comput. Phys. **204**, 378-398.

R. Horvath, L.C. Wilcox, H.C. Pedersen, N. Skiversen, J.S. Hesthaven and P.M. Johansen, *Analytical Theory of Grating Couplers for Waveguide Sensing: A Perturbational Approach and its Limitations*, Appl. Phys. B: Lasers and Optics **81**, 65-73.

Q. Y. Chen, D. Gottlieb, and J. S. Hesthaven, *Pseudospectral Methods using Prolate Spheroidal Wavefunctions*, SIAM J. Numer. Anal. **43**, 912-1933.

D. Xiu and J.S. Hesthaven, *High-Order Collocation Methods for Differential Equations with Random Inputs*, SIAM J. Sci. Comput. **27**, 1118-1139.

2006 **J. Grooss and J.S. Hesthaven**, *A Levelset Discontinuous Galerkin Method for Free Surface Flows*, Comput. Methods Appl. Mech Engrg. **195**, 3406-3429.

G. Jacobs and J.S. Hesthaven, *High-Order Nodal Discontinuous Galerkin Particle-in-Cell Methods on Unstructured Grids*, J. Comput. Phys. **214**, 96-121.

C. Chauviere, J.S. Hesthaven, and L. Lurati, *Computational Modeling of Uncertainty in Time-Domain Electromagnetics*, SIAM J. Sci. Comp. **28**(2), 751-775.

M.S. Kilic, G.B. Jacobs, J.S. Hesthaven, and G. Haller, *Reduced Navier-Stokes Equations Near a Flow Boundary*, Physics D **217**, 161-185.

J. S. Hesthaven, S.M. Kaber, and L. Lurati, *Pade-Legendre Interpolants for Gibbs Reconstruction*, J. Sci. Comput. **28**(2-3), 337-359.

S. Abarbanel, D. Gottlieb, and J. S. Hesthaven, *Nonlinear PML for Electromagnetics*, J. Sci. Comput **28**(2-3), 125-137.

A. Kanevsky, M. Carpenter, and J. S. Hesthaven, *Idempotent Filtering in Spectral and Spectral Element Methods*, J. Comp. Phys. **220**(1), 41-58.

A. Engsig-Karup, J. S. Hesthaven, H. Bingham, and P. Madsen, *Nodal DG-FEM Solution of High Order Boussinesq-Type Equations*, J. Engin. Math. **56**(3), 351-370.

2007 **H. Salman, J.S. Hesthaven, T. Warburton, and G. Haller**, *Predicting Transport by Lagrangian Coherent Structures with a High Order Method*, J. Theo. Comput. Fluid Dyn. **21**(1), 39-58.

S. Chun and J.S. Hesthaven, *Modeling of the Frozen Mode Phenomenon and its Sensitivity using Discontinuous Galerkin Methods*, Commu. Comput. Phys. **2**, 611-639.

A. Kanevsky, M. Carpenter, D. Gottlieb,and J.S. Hesthaven, *Application of implicit-explicit high-order Runge-Kutta Methods to Discontinuous Galerkin Schemes*, J. Comput. Phys. **225**(2), 1753-1781.

C. Chauviere, J.S. Hesthaven, and L. Wilcox, *Efficient Computation of RCS from Scatterers of Uncertain Shapes*, IEEE Trans. Antennas Propagat. **55**(5), 1437-1448.

L. N. Olson, J. S. Hesthaven, and L.C. Wilcox, *Developments in Overlapping High-Order Nodal Discontinuous Galerkin Methods*, Lect. Notes Comput. Sci. Eng. **55**, 325-332.

2008 **J. S. Hesthaven and R. M. Kirby**, *Filtering in Legendre Spectral Methods*, Math. Comp. **77**(263), 1425-1452.

S. Chun and J.S. Hesthaven, *PDE Constrained Optimization and Design of Frozen Mode Crystals*, Comm. Comput. Phys. **3**(4), 878-898.

A.P. Engsig-Karup, J.S. Hesthaven, H.B. Bingham, and T. Warburton, *DG-FEM Solution for Nonlinear Wave-Structure Interaction using Boussinesq-type Equations*, Costal Engineer. **55**(3), 197-208.

E. Brodal, J.S. Hesthaven and F. Melandsø , *Numerical Modeling of Double-Layered Piezeelectric Transducer Systems using a High-Order Discontinuous Galerkin Method*, Comp. Struct. **86**(17-18), 1747-1756.

2009 **Y. Chen, J.S. Hesthaven, Y. Maday, and J. Rodriguez**, *A Monotonic Evaluation of Lower Bounds for inf-sup Stability Constants in the Frame of Reduced Basis Methods*, C.R. Acad. Sci. Paris, Ser I **346**(23-24), 1295-1300.

G. J. Gassner, F. Lörcher, C.D. Munz, and J.S. Hesthaven, *Polymorphic Nodal Elements and their Application in Discontinuous Galerkin Methods*, J. Comput. Phys. **228**, 1573-1590.

S. Chun and J.S. Hesthaven, *High-Order Accurate Thin Layer Approximations for Time-Domain Electromagnetics and Their Implementation. I: General metal backed coatings.*, J. Comp. Appl. Math. **231**, 598-611.

A.C. Yucel, H. Bagci, J.S. Hesthaven, and E. Michielssen, *A Fast Stroud-based Collocation Method for Statistically characterizing EMI/EMC Phenomena on Complex Platforms*, IEEE Trans. EMC/EMI **51**(2), 301-311.

J.S. Hesthaven, S. Lau, and H. Pfieffer, *IMEX Evolution of Scalar Fields on Curved Backgrounds*, Commun. Comput. Phys **6**, 997-1021.

Y. Chen, J.S. Hesthaven, Y. Maday, and J. Rodriguez, *Improved successive constraint method based a posteriori error estimate for reduced basis approximation of 2D Maxwell's problem*, M2AN **43**(6), 1099-1116.

G. Jacobs and J.S. Hesthaven, *Implicit-explicit time integration of a high-order particle-in-cell method with hyperbolic divergence cleaning*, Comput. Phys. Comm. **180**, 1760-1767.

A. Kloeckner, T. Warburton, J. Bridges, and J.S. Hesthaven, *Nodal Discontinuous Galerkin Methods on the Graphics Processor*, J. Comput. Phys. **228**, 7863-7882.

S. Field, J.S. Hesthaven, and S. Lau, *Discontinuous Galerkin methods for the extreme mass-ratio dynamics on Swartzschild background*, Class Quan Gravity **26**, 165010-165038.

2010 **Y. Chen, J.S. Hesthaven, Y. Maday, and J. Rodriguez**, *Certified Reduced Basis Methods and Output Bounds for the Harmonic Maxwell's Equations*, SIAM J. Sci. Comput **32**, 970-996.

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1996 **J. S. Hesthaven**, *A Stable Spectral Multi-Domain Method for the Unsteady, Compressible Navier-Stokes Equations*, Proc. of The 9'th International Conference on Domain Decomposition, Bergen, Norway. 121-129.

1997 **B. Yang, D. Gottlieb, and J. S. Hesthaven**, *On the Use of PML ABC's in Spectral Time-Domain Simulations of Electromagnetic Scattering*, Proc. of The 13'th Annual Review of Progress in Applied Computational Electromagnetics, Monterey, CA, USA. 926-933.

1998 **J. S. Hesthaven, P. G. Dinesen, and J. P. Lynov**, *Pseudospectral Time-Domain Modeling of Diffractive Optical Elements*, Proc. of The 14'th Annual Review of Progress in Applied Computational Electromagnetics, Monterey, CA. 858-865.

P. G. Dinesen, L. Lading, J. P. Lynov, and J. S. Hesthaven, *Waveguides and Diffractive Elements for Non-Contact Sensors: Analysis*, Proc. of Diffractive Optics and Micro-Optics, Hawaii, USA. 209-211.

1999 **K. Dridi and J. S. Hesthaven**, *N-space Staircase-Free Finite-Difference Time-Domain Formulation for Arbitrary Material Distributions: Numerical Investigations on a Focusing Grating Coupler in Dielectric Waveguides*, Proc. of Integrated Photonics Research IPR 99, Santa Barbara, CA, USA. 250-252.

2000 **P. G. Dinesen, J. S. Hesthaven,and J. P. Lynov**, *Rigorous Three-Dimensional Analysis of Surface-Relief Gratings Using a Spectral Collocation Method*, In Diffractive/Holographic Technologies and Spatial Light Modulators 7. Optoelectronics 2000, San Jose, CA. Cindrich, I.; Lee, S.H.; Sutherland, R.L. (eds.), International Society for Optical Engineering, Bellingham, WA, USA, Proceedings of SPIE **3951**, 2-10.

P. G. Dinesen, J. S. Hesthaven, and J. P. Lynov, *Rigorous Analysis of Focusing Grating Couplers Using a Time-Domain Spectral Collocation Method*, In Diffractive/Holographic Technologies and Spatial Light Modulators 7. Optoelectronics 2000, San Jose, CA. Cindrich, I.; Lee, S.H.; Sutherland, R.L. (eds.), International Society for Optical Engineering, Bellingham, WA, USA, Proceedings of SPIE **3951**, 11-19.

P. G. Dinesen and J. S. Hesthaven, *Rigorous 3-D Analysis of Focusing Grating Couplers Using a Spectral Collocation Method*, In Technical digest. Diffractive Optics and Micro-Optics Meeting and Table Top Exhibit, Quebec City, Canada. Optical Society of America, OSA Technical Digest series. 81-83.

P. G. Dinesen and J. S. Hesthaven, *Analysis of Grating Couplers Using the Boundary Variation Method*, In Technical digest. Diffractive Optics and Micro-Optics Meeting and Table Top Exhibit, Quebec City, Canada. Optical Society of America, OSA Technical Digest series. 84-86.

2001 **J. S. Hesthaven and T. Warburton**, *High-Order/Spectral Unstructured Grid Methods for the Time-Domain Solution of Maxwell's Equations*, In Fourth International Workshop on Computational Electromagnetics in the Time-Domain: TLM/FDTD and Related Techniques, Nottingham, UK. C. Christopoulos (Eds). 47-53.

A. Ditkowski, K. Dridi, J. S. Hesthaven, and C. H. Teng, *Embedded FDTD Methods for Maxwell's Equations*, In Fourth International Workshop on Computational Electromagnetics in the Time-Domain: TLM/FDTD and Related Techniques, Nottingham, UK. C. Christopoulos (Eds). 1-6.

2002 **J. S. Hesthaven and T. Warburton**, *High-Order Unstructured Grid Methods for Time-Domain Electromagnetics*, AIAA Paper 2002-1092, 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, USA, 12 pages.

G. Haller, Y. Wang, H. Salman, J. S. Hesthaven, and A. Banaszuk, *Control of Lagrangian Coherent Structures*, In IUTAM Symposium on Unsteady Separated Flows, Toulouse, France.

J. Wyller, J. S. Hesthaven, and J. J. Rasmussen, *Optical Solitons in the Femtosecond Regime*, In Nonlinear Guides Waves and Their Applications, Stresa, Italy.

2003 **C. Chauviere, J. S. Hesthaven, A. Kanevsky, and T. Warburton**, *High-Order Localized Time Integration for Grid-Induced Stiffness*, 2nd MIT Conference on Fluid Dynamics, Boston, USA. Vol II, 1883-1886.

2005 **J. S. Hesthaven, L. Olson, and L. Wilcox**, *Two-Level Overlapping Schwarz Preconditioning of Nodal Discontinuous Galerkin Approximations of the Indefinte Helmholtz Equation*, Proceedings of the 16th International Conference on Domain Decomposition, New York, USA.

C. Eskilsson, A. P. Engsig-Karup, S. J. Sherwin, J. S. Hesthaven, and L. Bergdahl, *The Next Step in Coastal Numerical Models: Spectral/hp Element Methods?*, Proceedings of the 5th International Symposium on Ocean Wave Measurements and Analysis (Waves 2005), Madrid, Spain.

C. Chauviere, J.S. Hesthaven, and L.Lurati, *Computational Modeling of Uncertainty in Time Domain Electromagnetics*, Proceedings of Computational Electromagnetics in the Time-Domain, CEM-TD 2005, Georgia Tech, Atlanta, USA. 32-35.

2006 **A.P. Engsig-Karup, H.B. Bingham, P.A. Madsen, and J.S. Hesthaven**, *An Unstructured DG-FEM Method for Nonlinear Wave-Structure Interaction*, Proceedings of International Workshop on Water Waves and Floating Bodies, 4 pages.

2007 **C. Chauviere, J.S. Hesthaven, L. Lurati, and L.C. Wilcox**, *DG-FEM for CEM with Uncertainty*, Proceedings of 23rd International Review of Progress in Applied Computational Electromagnetics, Verona, Italy.

J.S. Hesthaven, Y. Maday, and J. Rodriguez, *Reduced basis output bounds for harmonic wave propagation problems*, Proceedings of 8th International Conference on Mathematical and Numerical Aspects of Wave Propagation, Waves-2007, University of Reading, UK.

2008 **J. Weirich, J. Laegsgaard, T. Tanggaard Alkeskjold, J. S. Hesthaven, L. Scholari, L. Wei, L. Eskildsen, and A. Bjarklev**, *Biased Liquid Crystal Photonic Bandgap Fiber*, In Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference and Photonic Applications Systems Technologies, OSA Technical Digest (CD) (Optical Society of America, 2008), paper CThEE6.

H. Bagci, C. Yavuz, A.C. Yucel, J.S. Hesthaven, and E. Michielssen, *A fast and parallel stroud-based stochastic collocation method for statistical EMI/EMC analysis*, In IEEE International Symposium on Electromagnetic Compatibility 2008, EMC 2008. Detroit, MI, USA. 1-5.

2009 **Y. Chen, J.S. Hesthaven, Y. Maday, and J. Rodriguez**, *Reduced basis methods for electromagnetics*, Proceedings of 9th International Conference on Mathematical and Numerical Aspects of Wave Propagation, Pau, France. 25-30.

S. Chun, H. Haddar, J.S. Hesthaven, A. Kloeckner, T. Warburton, and L. Wilcox, *Overcoming Performance Bottlenecks in DG-FEM for EM Problems*, Proceedings of 9th International Conference on Mathematical and Numerical Aspects of Wave Propagation, Pau, France. 80-81.

2010 **J.S. Hesthaven, T. Warburton, C. Chauviere and L. Wilcox**, *High-order discontinuous Galerkin methods for computational electromagnetics and uncertainty quantification*, J. Roos and L.R.J Costa (Eds), Scientific Computing in Electrical Engineering SCEE 2008. Mathematics in Industry **4**. Proceedings of 7th International Conference on Scientific Computing in Electrical Engineering (SCEE 2008), Hensinki University of Technology, Hensinki, Finland. 403-412.

Y. Chen, J.S. Hesthaven and Y. Maday, *A Seamless Reduced Basis Element Method for 2D Maxwell's Problem: An Introduction*, J. S. Hesthaven and E. Rø nquist (Eds), Spectral and High-Order Methods for Partial Differential Equations, Springer Lecture Notes in Computational Science and Engineering **76**, Springer Verlag, Berlin. 141-152..

2012 **A.L. Tampos, J.E.C. Lope, and J.S. Hesthaven**, *Singularity-based approach in a Pade-Chebyshev resolution of the Gibbs phenomenon*, Proceedings of the World Congress on Engineering 2012, London, UK. Volume I, 24-29, [Certificate of Merit].

2016 **A. S. Nielsen and J. S. Hesthaven**, *Fault Tolerance in the Parareal Method*, ACM Workshop on Fault-Tolerance for HPC at Extreme Scale (FTXS). Kobe, Japan, 8 pages.

2018 **J.S. Hesthaven, F. Monkeberg, and S. Zaninelli**, *RBF Based CWENO Method*, Proceedings for ICOSAHOM'18, London, UK, 10 pages.

2019 **F. Pind, C.-H. Jeong, J.S. Hesthaven, A.P. Engsig-Karup and J. Strømann-Andersen**, *Modeling boundary conditions in high-order, nodal, time-domain finite element methods*, Proceedings for 23rd International Conference on Acoustics, Aachen, Germany, 8 pages.

Invited presentations

Distinguished lectures

2012 *Brent Smith Memorial Lecture*, Kansas State University, USA

The Peachman Lecture, Rice University, USA

Zhiyuan College Salon Talk, Shanghai Jiao Tong University, Shanghai, PRC

2017 *CCAM Distinguished Lecture*, Center for Computational and Applied Mathematics, Purdue University, USA

2020 *Carl J. Rees Distinguished Lectures*, Department of Mathematical Sciences, University of Delaware, USA

2021 *Distinguished Colloquium*, Department of Mathematical Sciences, Michigan Technological University, USA

Plenary and keynote lectures at international events

1998 *Spectral Penalty Methods*. International Conference on High-Order and Spectral Methods, ICOSAHOM'98, Herzliya, Israel.

2004 *Towards Flexible and Robust High-Order Methods for Multiphysics Applications*. International Workshop on Advances in Computational Multiphysics, Darmstadt, Germany.

2005 *Some Time-Integration Techniques for DGFEM Solution of Fluid Flows*. FEF05 - Thirteenth Conference on Finite Elements for Flow Problems, Swansea, Wales, UK.

2007 *Nodal DG-FEM for Free Surface Flows using High-Order Boussinesq Approximations*, 2nd International Conference on High-Order Non-Oscillatory Methods for Wave Propagation, Transport, and Flow Problems, Trento, Italy.

2008 *High-order Discontinuous Galerkin Methods for Computational Electromagnetics and Uncertainty Quantification*. 7th International Conference on Scientific Computing in Electrical Engineering (SCEE 2008), Hensinki University of Technology, Hensinki, Finland.

Certified Reduced Basis Methods for Wave Problems, 3rd International Conference on Scientific Computing and Partial Differential Equations, Hong Kong, Hong Kong.

2009 *Certified Reduced Basis Methods*, Second International Conference on Finite Element Methods in Engineering and Science (FEMTEC 2009), Lake Tahoe, CA, USA.

Certified Reduced Basis Methods for Wave Problems. Ninth International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2009), Pau, France.

2010 *Reduced methods you can believe in*, BIT 50 - Trends in Numerical Computing, Lund, Sweden.

Reduced methods you can believe in, International Workshop on Multi-Scale Methods in Computational Engineering, Darmstadt, Germany.

2011 *Towards Efficient Absorbing Layers for Gas Dynamics through Boltzmann Approximations*, International Conference on Advances in the Analysis and Numerical Analysis of Partial Differential Equations, Tel Aviv, Israel.

Reduced order modeling for wave problems, Baylor Workshop on Splitting and Multiscale Methods for Computational PDE's, Baylor University, Waco, TX, USA.

2012 *Reduced methods you can believe in*, 8th International Conference on Scientific Computing and Applications, Las Vegas, NV, USA.

Reducing the computational complexity of the reduced basis methods for high-dimensional parameter spaces, Reduced Basis, POD and Reduced Order Methods for the model and computational reduction: Towards real-tie computing and visualization. EPFL, Lausanne, Switzerland.

High-order accurate methods for surface flows using high-order Boussinesq models, XIX International Conference on Computational Methods in Water Resources, Urbana-champaign, IL, USA.

Compressed Sensing and its Application to fMRI Imaging, BIT Circus, Copenhagen, Denmark.

2013 *Reduced order models you can believe in*, SIAM Computational Science and Engineering (SIAM-CSE), Boston, USA.

Hybrid Fourier WENO Methods for Shock Problems, Conference in honor of 80th birthday of V. Ryaben'kii, Moscow, Russia.

High-order accurate reduced basis multi-scale finite element methods, ENUMATH 2013, Lausanne, Switzerland.

Battling Bottlenecks: Overcoming the computational complexity of reduced basis methods for high-d parameter spaces, MODRED 2013, MPI Madgeburg, Germany.

2014 *Spectral Methods for Fractional Differential Equations*, Workshop on Fractional PDE's, Texas A&M, College Station, USA.

On the Parareal Method for Conservation Laws, Advances in the numerical solution of hyperbolic conservation laws, Stuttgart, Germany.

2015 *High-order methods for fractional differential equations*, Numerical Treatment of Differential and Differential-Algebraic Equations - Numdiff-14, Halle, Germany.

High-order methods for fractional differential equations, 26th Biennial Numerical Analysis Conference, Glasgow, Scotland.

2016 *Efficient preconditioning of hp-FEM matrices by hierarchical low-rank approximations*, XVth Conference on the Mathematics of Finite Elements and Applications - MAFELAB 2016, Brunel University, UK.

Multi-scale time-stepping in particle-in-cell methods, 4th CAM-ICCM Workshop: Multiscale and Large-scale Scientific Computing, City University of Hong Kong, Hong Kong.

2017 *Structure preserving reduced order models*, Frontiers in Applied and Computational Mathematics, Brown University, RI, USA.

Parallel-in-time integration for hyperbolic problems, Numerical methods for hyperbolic equations: recent trends and new directions - NUMHYP'17, Monte Verita, Switzerland.

Structure preserving reduced order models, QUIET 2017 - Quantification of Uncertainty: Improving Efficiency and Technology, Trieste, Italy.

Advances in Reduced Order Modeling, Optimization in Scientific Computing, Chinese University of Hong Kong, Hong Kong.

Reduced order modeling through neural networks, Conference on Uncertainty Quantification in Computational Fluid Dynamics, Shanghai, China.

2018 *Parareal for Transport Dominated Problems*, 7th International Workshop on Parallel-in-time Methods, Roscoff, France.

Parallel-in-Time Methods for Transport-Dominated Problems, CoSaS 2018 International Symposium on Computational Science at Scale, Erlangen, Germany.

Adaptive discontinuous Galerkin method for tsunami modeling and prediction on a global scale. International Conference on Advances in Applied Mathematics in memoriam of Professor Saul Abarbanel, Tel Aviv, Israel.

2019 *Controlling Oscillations in High-Order Accurate Methods through Neural Networks*. European Workshop on High Order Nonlinear Numerical Methods for Evolutionary PDEs: Theory and Applications (HONOM'19), Madrid, Spain.

Precision Algorithms. 3rd International Conference on Numerical Computations: Theory and Algorithms, Calabria, Italy.

Controlling oscillations in high-order accurate methods through neural networks. Tianfu International Conference on Partial Differential Equations, Chengdu, China.

Non-Intrusive Reduced Order Models for Fluid Dynamics. International Symposium on High-Fidelity Computational Methods & Applications 2019 (HiFiCoMa 2019), Shanghai, China.

2021 *Non-intrusive reduced order models*. IAS Conference on Industrial and Applied Mathematics, HKUST IAS, HK.

Non-Intrusive Reduced Order Models using Physics Informed Neural Networks. RAMSES: Reduced order models; Approximation theory; Machine learning; Surrogates, Emulatore and Simulators, SISSA, Trieste, Italy.

2022 *Structure Preserving Reduced Order Models*. International Congress of Mathematics, St. Petersburg, Russia (moved online)

On the use of artificial neural networks when solving conservation laws. XVIII International Conference on Hyperbolici Problems: Theory, Numerics and Applications, Malaga, Spain

Non-Intrusive Reduced Order Models using Physics Informed Neural Networks. International Conference on Scientific Machine Learning, Seoul, South Korea

2023 *Digital twins through reduced order models and machine learning*. International Conference on Applied Mathematics (ICAM), Hong Kong

Structure-preserving model order reduction. The Seventh International Conference on Scientific Computing and Partial Differential Equations (SCPDE23), Hong Kong

Towards digital twins through reduced order models and machine learning. Twentieth First International Conference on Numerical Analysis and Applied Mathematics 2023 (ICNAAM 2023), Crete, Greece

Neural Networks as Closure Models. Second HKSIAM Biannual Conference, Hong Kong

2024 *TBD*. International Conference on Mathematical Modeling and Numerical Methods, Beijing, PRC

Plenary lectures at regional meetings

1994 *The Penalty Method for Systems of Hyperbolic and Mixed Type*. Spectral Multi-Domain Workshop, Rayleigh, North Carolina, USA.

2002 *High-Order Methods in Time-Domain Electromagnetics*. Recent Advances and State-of-the-Art in Computational Electromagnetics, Army High Performance Computing Research Center (AHPCRC), Minnesota, MN, USA.

High-Order Accurate Discontinuous Element Methods: Analysis, Algorithms, and Applications. Adaptive and High-Order Methods with Applications in Turbulence. National Center for Atmospheric Research (NCAR), Boulder, CO, USA.

2003 *Recent Advances and Emerging Challenges in Computational Electromagnetics*. Spring Meeting of the Swiss Mathematical Society, Basel, Switzerland.

2007 *Computing with Uncertainties*. Norwegian Research Foundation Fall Meeting in Computational Mathematics (BeMATA), Oslo, Norway.

DG-FEM for Modeling of Free Surface Flows using High-Order Boussinesq Approximations, Advanced in DG-FEM Methods for PDE's, Banff, Canada.

2008 *Discontinuous Galerkin Methods: The Right Tool for CSE?*. CSE Symposium, Urbana-Champaign, USA.

2011 *Gravitational Wave Physics: Challenges and Opportunities for the Numerical Analyst*, Midwest Numerical Analysis Days, Purdue University, USA.

Reduced methods you can believe in, New York Conference on Applied Mathematics, Buffalo, NY, USA.

Discontinuous Galerkin Methods for Electromagnetics: Advances, Challenges, and Opportunities, DG in EM: A Workshop on Recent Developments in Theory and Applications, NLR, Amsterdam, The Netherlands.

GPU Accelerated High-Order Hybrid Methods for Shock Problems, DOE Applied Mathematics Program Meeting, Washington DC, USA.

2012 *Certified Reduced Basis Methods for Integral Equations*, Israeli Symposium on Computational Mechanics (ISME-33), Technion, Israel.

Reducing Computational Complexity in UQ, Winter Enrichment Program (WEP), KAUST, Saudi Arabia.

2013 *Reduced order models you can believe in*, Annual meeting of the Canadian Applied and Industrial Mathematical Society, Quebeq City, Canada.

Reduced order models you can believe in, DelMar Numerics Day, Maryland, USA.

Reduced models and the bottlenecks for problems with many parameters, RBM in Gravity Workshop, CalTech, USA.

High-order accurate reduced basis multi-scale finite element methods, AC.CES 2013, Aachen, Germany.

Hybrid Fourier WENO Methods for Shock Problems, CADMOS Day, Geneva, Switzerland.

2014 *On the illusive stability of the Parareal method*, Alan Turing Day 2014, University of Manchester, UK.

2016 *Reduced order models for constrained problems*, Recent developments in numerical methods for model reduction, Institut Henri Poincare, Paris, France.

2017 *Structure preserving reduced order models*, Conference in honor of the 60th birthday of Yvon Maday, Roscoff Station, France.

2018 *Deep Neural Networks in Simulation Science*, SimTech Conference, Stuttgart, Germany.

2019 *Precision Algorithms: Algorithm Augmentation by Machine Learning*. Future Challenges and Opportunities in Computational Science and Engineering Symposium, Toronto, Canada.

Structure preserving reduced order modeling. Nederlands Mathematisch Congres 2019, Eindhoven, The Netherlands.

On the Use of Machine Learning in Computational Science and Engineering. Workshop on Scientific Computation using Machine-Learning Algorithms, Nottingham, UK.

One perspective on the use of machine learning in CSE. Institute of Computational Science (MICDE) annual symposium, Univ of Michigan, USA.

How to model a Tsunami. SIAM Front Range Applied Math Student Research Conference, University of Colorado, Denver, USA.

2020 *Precision Algorithms: Algorithmic Augmentation by Machine Learning*. Workshop on Scientific Machine Learning, University of Cologne, Germany.

Controlling oscillations in high-order accurate methods through neural networks, 32nd CEA/GAMNI Seminar on Numerical Fluid Dynamics, Institut Henri Poincaré, France.

Nonintrusive Reduced Order Models using Physics Informed Neural Networks, Workshop on Computation and Applications of PDEs Based on Machine Learning, Tianyuan Mathematical Center, China.

2021 *Nonintrusive reduced order models using physics informed neural networks*. AAAI Spring Symposium on Combining Machine Learning with Physical Sciences, Stanford, USA

Digital twins at the interface between modeling, measurements, and machine learning. 2nd Workshop in Industrial Mathematics, Catania, Italy

2022 *Trends in Reduced Order Modeling*. MOX 20th Anniversary, Milano, Italy

Digital Twins through Reduced Order Models and Machine Learning. Model Reduction and Surrogate Modeling (MORE), Berlin, Germany

Non-Intrusive Reduced Order Models through Neural Networks. 96th Annual Meeting of the International Association for Applied Mathematics and Mechanics, Aachen, Germany

2023 *Neural Networks as Closure Models*. Workshop on Scientific Machine Learning, Amsterdam, Netherlands

Invited program participation

2003 *Computational Challenges in PDE's*, Isaac Newton Institute for the Mathematical Sciences, Cambridge University, UK.

2005 *Multiscale Processes in Fusion Plasma*, IPAM, UCLA, USA.

2007 *DG-FEM for PDE's*, Banff International Station for Mathematical Innovation and Discovery (BIRS), Canada.

2010 *Novel Discretizations*, IMA, University of Minnesota, USA.

2012 *High-Order Methods for Partial Differential Equations*, Hausdorff Research Institute for Mathematics, Bonn, Germany.

Theory and Applications of Discontinuous Galerkin Method, Oberwolfach, Germany.

Computational methods in high-energy density plasmas, IPAM, UCLA, CA, USA.

2015 *Advanced in High Performance Computing*, Mathematical Sciences Institute, Singapore.

Porous Media and Processes, International Center for Mathematical Sciences, Edinburgh, Scotland.

2016 *Numerical Methods for Nonlinear Problems*, Tsinghua Sanya International Mathematics Forum (TSIMF), Sanya, China.

2018 *Advances in PDEs: Theory, Computation and Application to CFD*, ICERM, USA.

2020 *Advances in Computational Relativity*, ICERM, USA.

Workshop presentations

1997 *Spectral Methods for Viscous Compressible Flows in Complex Geometries*. Proc. of SIAM's 45'th Anniversary Meeting, Stanford University, USA.

Spectral Methods for Electromagnetic Scattering, AFOSR Electromagnetics Workshop, San Antonio, Texas, USA.

1998 *Advances in Pseudospectral Time-Domain Methods for Computational Electromagnetics*. AFOSR Electromagnetics Workshop, San Antonio, Texas, USA.

1999 *Fast Stable Spectral Methods on Unstructured Grids*. Proc. of Fourth International Congress on Industrial and Applied Mathematics, Edinburgh, Scotland.

2000 *High-Order Unstructured Grid Time-Domain Method in Computational Electromagnetics*. 2000 SIAM Conference on Computational Science and Engineering Washington DC, USA.

Advances in High-Order Time-Domain Methods for Computational Electromagnetics. AFOSR Electromagnetics Workshop, San Antonio, Texas, USA.

2001 *Embedded Finite Difference Methods for Wave Problems in Complex Geometries and Heterogeneous Media*. Proc. of 96'th AMS Regional Meeting. Las Vegas, NV, USA.

Advances in High-Order Time-Domain Methods for Computational Electromagnetics, AFOSR Electromagnetics Workshop, San Antonio, Texas, USA.

2002 *High-Order Unstructured Grid Methods for Conservation Laws*. Joint Mathematics Meetings, San Diego, USA.

2003 *High Order Nodal DG-FEM for the Maxwell Eigenvalue Problem*, Mafelap 2003, Brunel University, UK.

2004 *High-Order Accurate Time-Domain Solution of Maxwell's Equations in Complex Geometries*. Progress in Electromagnetic Research Symposium, PIERS 2004, Pisa, Italy.

Time-Domain Solution of Maxwell's Equations with Uncertainty using Homogeneous Chaos Expansions. Progress in Electromagnetic Research Symposium, PIERS 2004, Pisa, Italy.

Advances in High-Order Time-Domain Methods for Computational Electromagnetics. AFOSR Electromagnetics Workshop, San Antonio, Texas, USA.

2005 *Towards High-Order PIC Methods on Unstructured Grids*. IPAM Workshop on Multiscale Processes in Fusion Plasma, UCLA, USA.

2007 *Uncertainty Quantification in Electromagnetic Scattering*, SIAM Conference on CSE (CSE07), Costa Mesa, CA, USA.

DG-FEM for CEM with Uncertainty. 23rd International Review of Progress in Applied Computational Electromagnetics, Verona, Italy.

Modeling and Design of Frozen Mode Crystals. International Conference on Spectral and High-Order Methods (ICOSAHOM 2007), Beijing, China.

Uncertainty Quantification in Electromagnetic Scattering, International Conference on Spectral and High-Order Methods (ICOSAHOM 2007), Beijing, China.

2009 *Nodal discontinuous Galerkin methods on graphics processing units (GPUs).* International Conference on Spectral and High-Order Methods (ICOSAHOM 2009), Trondheim, Norway.

Generalized Wiener rational functions, International Conference on Spectral and High-Order Methods (ICOSAHOM 2009), Trondheim, Norway.

Certified reduced basis methods for Maxwell's equations, International Conference on Spectral and High-Order Methods (ICOSAHOM 2009), Trondheim, Norway.

2010 *Computational Science using Graphics Processing Units (GPU's)*, HPC Symposium, University of Chile, Santiago, Chile.

2011 *On the use of ANOVA expansions in UQ*, SIAM CSE conference, San Diego, USA.

Toward a Particle-in-Cell Solver based on Discontinuous Galerkin Methods, SIAM CSE conference, San Diego, USA.

Toward full electromagnetic kinetic simulations: Challenges and Ideas, Center for Plasma Edge Simulation (CPES) annual meeting, New York, USA.

GPU accelerated high-order accurate methods for shock problems, GPULab days, Lyngby, Denmark.

2013 *CCV: A case study on the importance of shared infrastructure and integrated support for data-rich scholarship*, Informatics and Data Exploration Symposium Infrastructure in Scholarship - Education, RI, USA.

Reduced models and the bottlenecks for problems with many parameters, RBM in Gravity Workshop, CalTech, USA.

High-order accurate reduced basis multi-scale finite element methods, AC.CES 2013, Aachen, Germany.

Hybrid Fourier WENO Methods for Shock Problems, CADMOS Day, Geneva, Switzerland.

2014 *On the illusive stability of the Parareal method*, Alan Turing Day 2014, University of Manchester, UK.

2018 *Non-intrusive Reduced Order Models for CFD*, DANSIS Seminar, Aarhus, Denmark.

2019 *Why Math Matters*, DTU Teaching Seminar, Lyngby, Denmark.

2020 *Digital Twins at the interface between modeling, measurements, and machine learning*, Centrum Wiskunde & Informatics (CWI).

Colloqia and seminars

1995 Department of Optics and Fluid Dynamics, Risø National Laboratory, Denmark.

1996 Department of Mathematics, University of New Hampshire, USA
Department of Optics and Fluid Dynamics, Risø National Laboratory, Denmark.
Institute for Computer Applications in Science and Engineering, NASA Langley, USA.

1997 Applied Mathematics, California Institute of Technology, USA.
Department of Mathematics, University of Southern California, USA.
The Courant Institute, New York University, USA.
Applied Physics, Columbia University, USA.
Institute of Electromagnetics, Technical University of Denmark, Denmark.
Department of Optics and Fluid Dynamics, Risø National Laboratory, Denmark.
Department of Mathematics, North Carolina State University, USA.
Department of Mathematical Sciences, Rensselaer Polytechnic Institute, USA.

1998 Applied Mathematics, Massachusetts Institute of Technology, USA.
Division of Applied Mathematics, Brown University, USA.
Department of Mathematics, Florida State University, USA.

1999 Department of Mathematics, University of Michigan, USA.
Department of Mathematics, Purdue University, USA.
Department of Mathematics, University of North Carolina at Chapel Hill, USA.
Department of Mathematics, Penn State University, USA.
Institute for Computer Applications in Science and Engineering, NASA Langley, USA.
Department of Mathematics, Old Dominion University, USA.
Department of Applied Mathematics, University of Colorado, Boulder, USA.
United Technologies Research Center, Hartford, USA.

2000 SCOREC, Rensselaer Polytechnic Institute, USA
Department of Mathematics, Arizona State University, USA
CASC, Lawrence Livermore National Laboratory, USA
A Division, Lawrence Livermore National Laboratory, USA
Department of Electrical Engineering, Duke University, USA
Department of Mathematical Modeling, Technical University of Denmark, Denmark

2001 United Technologies Research Center, Hartford, USA.
Department of Optics and Fluid Dynamics, Risø National Laboratory, Denmark.
Aeronautics Division, Swedish Defense Research Agency, Sweden.
Department of Scientific Computing, Uppsala University, Sweden.
Department of Mathematical Sciences, University of Delaware, USA.
Department of Mathematical Sciences, Carnegie Mellon, USA.

2002 Department of Mathematics, Stanford University, USA.
INRIA-Rocquencourt, France.
Aeronautics Division, Swedish Defense Research Agency, Sweden.
Department of Mathematics, University of Basel, Switzerland.
Department of Electrical Engineering, Chalmers University of Technology, Sweden.
Mechanical Engineering, Massachusetts Institute of Technology, USA.
Department of Mathematics, Arizona State University, USA.
TICAM, University of Texas, Austin, USA.
Electromagnetics Branch, NASA Langley Research Center, Langley,USA.

2003 Department of Mathematics, University of Notre Dame, USA.
Department of Electrical Engineering, Chalmers University of Technology, Sweden.
Department of Mathematics, Purdue University, USA.

2004 Department of Mathematics, University of Wyoming, USA.
Department of Mathematics, North Carolina State University, USA.
Department of Mathematics, University of North Carolina at Charlotte, USA.
Sandia National Laboratory, Albequerque, USA.
Kirtland AFB, Albequerque, USA
INRIA-Rocquencourt, France.
INRIA-Sophia-Antipolis, France.
Department of Mathematics, University of Texas, El Paso, USA.
Massachusetts Institute of Technology, Department of Aeronautics, USA.

2005 Department of Scientific Computing, Uppsala University, Sweden.
CEMRACS, Marseille, France.

2006 Department of Mechanical Engineering, Technical University of Denmark, Denmark.
ONERA, Paris, France.

2007 Advanced Photon Source, Argonne National Laboratory, USA.
Department of Mathematics, Ocean University of China, China.
Department of Mathematics, Xi'an Jian Tong University, China.
Theory Center, Cornell University, USA.
Department of Mathematical Modeling, Technical University of Denmark, Denmark.

2008 Applied Mathematics and Applied Physics, Columbia University, USA.
Department of Mathematics and Statistics, University of New Mexico, USA.
Department of Mathematics, University of Massachusetts at Amherst, USA.
Institute of Mathematics, Ecole Polytechnique Fédéral de Lausanne, Switzerland.
INRIA-Sophia-Antipolis, France.
Institute of Mathematical Modeling, Technical University of Denmark, Denmark.
Department of Scientific Computing, Uppsala University, Sweden.
Department of Atmospheric Sciences, Texas A&M, USA.

2009 Applied Mathematics and Applied Physics Columbia University, USA.
ONERA, Toulouse, France.
Applied and Computational Mathematics, California Institute of Technology, USA.
Department of Applied Mathematics, Massachusetts Institute of Technology, USA.
Department of Mathematics, University of Illinois at Chicago, USA.
INRIA Sophia-Antipolis, France.

2010 Department of Mechanical Engineering, McGill University, Canada.
Mathematics Colloqium, New York University, USA.
Plasma Physics Seminar, New York University, USA.
Mathematics Colloqium, Michigan State University, USA.
Department of Optics and Fluid Dynamics, Risø National Laboratory, Denmark.

2011 Center for Computation and Technology Colloqium, Louisiana State University, USA.
Department of Mathematics, University of Alabama, USA.
Department of Mathematics, Pennsylvania State University, USA.
Institute of Mathematics,Ecole Polytechnique Fédéral de Lausanne, Switzerland.

2012 Data science, Oak Ridge National Laboratory, USA.
Institute of Natural Sciences, Shanghai Jian Tong University, China.

2013 Department of Applied Mathematics and Computer Science, Technical University of Denmark, Denmark.
Department of Mathematics, University of Zurich, Switzerland.

2014 Department of Mathematics, Ocean University of China, China.

2015 Department of Mathematics, Beihang University, China.

2016 Department of Geoscience, University of Grenoble, France.

2018 Department of Mathematics, University of Oxford, UK.
Department of Mathematics, King Fahd University of Petroleum and Minerals, Saudi Arabia.

2019 Department of Mathematics, Peking University, China.
Department of Mathematics, Beihang University, China.
Department of Aeronautics, Beihang University, China.
Department of Mathematics, RWTH Aachen, Germany.
Department of Applied Mathematics, University of Colorado, Boulder, USA.
DTU Compute, DTU, Denmark

2020 Department of Mathematics, Imperial College London, UK
LJLL, Sorbonne University, Paris, France
Argonne National Laboratory, Chicago, USA
Department of Mathematics, Chinese University of Hong Kong, HK
Computational Mathematics Science and Engineering, Michigan State University, USA
MOX, Politechnico Milan, Italy
IIT Roorkee, Roorkee, India
Lawrence Livermore National Laboratory, California, USA

2021 IBM Dublin, Ireland
Department of Mechanical Engineering, University of Pennsylvania, USA
Department of Mathematics and Statistics, University of Strathclyde, Scotland
Center for Mathematics and Artificial Intelligence (CMAI), George Mason University, USA

2022 Department of Mathematics, National University of Singapore, Singapore
Department of Mathematics, University of Waterloo, Canada
POEMS, Inria, France

Research funding

Current projects

Next generation structural design and assessment tool for large-scale wind turbine applications, Innosuisse, Switzerland. 2020-2022

Completed projects

High Order Methods for the Numerical Simulation of High Speed Flows. Co-PI, AFOSR, USA. 1998-2001.

Facility for Local Postprocessing, Visualization and Animation of Remotely Simulated Very Large Temporal Datasets. Co-PI, AFOSR, USA. 2000-2001.

SIAM Travel Award to attend ICIAM'99 in Edinburgh, Scotland. 1999.

Collaborative Research on High Bit-Rate Communication: From Mathematical Development to Fiber Design. Co-PI, NSF, USA. 2000-2003.

Alfred P. Sloan Research Fellowship. PI, Alfred P. Sloan Foundation, USA. 2000-2003.

High-Order Accuracy Methods for the Modeling and Design of Micro Optics and Photonic Devices. PI, Army Research Office, USA. 2001-2004.

Advancing the Frontiers of Broad Band CEM for Modeling Full-Scale Treated Targets. DARPA, USA (subcontract to HyPerComp Inc., CA). 2001-2004.

High-Order Embedded Interface Methods for Wave-Problems. PI. NSF, USA. 2000-2003.

NASA Graduate Fellowship. PI (Graduate student - A. Kanevsky), NASA Langley Research Center, USA. 2001-2004.

NSF-SCREMS: Enrichment and Integration of Networked Computing Resources for the Mathematical Sciences, Co-PI, NSF, USA. 2004-2006.

Hierarchic Computing Facility Enabling Novel Algorithm Developments and Postprocessing for Large Scale Wave Problems, PI, AFOSR, USA. 2005-2006.

High-Order Accurate Particle-in-Cell (PIC) Methods on Unstructured Grids with Applications to Microwave Generation and Accelerator Modeling. PI, AFOSR, USA. 2005-2006.

Collaborative Effort on Approximate Boundary Conditions for Computational Wave Problems. PI. NSF, International Programs, USA. 2003-2007.

High-Order Accurate Time-Domain Electromagnetics and RCS Prediction for Dynamic or Uncertain Scatterers, PI. AFOSR Test and Evaluation Research Program, USA. 2004-2007.

Novel Approaches to the Modeling and Computations of Wave Phenomena. Co-PI, DARPA, USA. 2004-2007.

CAREER: Towards Robust and Efficient High-Order Adaptive Computational Methods for Conservation Laws in Complex Geometries. PI, NSF, USA. 2002-2008.

Collaborative Research ITR: An Integrated Simulation Environment for High-Resolution Computational Methods in Electromagnetics with Biomedical Applications, Co-PI, NSF, USA. 2004-2008.

Novel Techniques for Linear Accelerator Modeling and Design, PI, Department of Energy, USA. 2007-2008.

MURI: Conformal Antenna and Array Design using Noval Electronic Materials, Co-PI, ONR. USA. 2004-2009.

High-order unstructured PDE solvers on GPU's. Nvidia Professor Partnership program, PI, Nvidia Corporation, USA. 2009.

Novel Mathematical and Computational Techniques for Robust Uncertainty Quantification, Co-PI, AFOSR, USA. 2007-2010.

Reduced Basis Approximation and A Posteriori Error Estimation for Parametrized Partial Differential Equations with Application to Real-Time Reliable Estimation and Optimization, PI, AFOSR, USA. 2007-2010.

CGM Research: Developing a Multiscale Model for Melting and Melt Migration in the Mantle, Co-PI, NSF-CMG, USA. 2005-2010.

Discontinuous Galerkin Methods for Kinetic Plasma and Hybrid Plasma/Fluid Modeling with Applications to Microwave Generation and Laser-Matter Interaction, PI, AFOSR, USA. 2007-2010.

FRG: Collaborative Research: Developing Spectral Methods for Numerical Solutions of the Einstein Equations. PI, NSF, USA. 2006-2011.

SCREMS: High order numerical algorithms and their applications, Co-PI, NSF-DMS, USA. 2009-2011.

Hybrid computing facilities enabling novel algorithm development for stochastic simulations and research-related education, Co-PI, AFOSR, USA. 2010-2011.

Parallel High Order Accuracy Methods Applied to Non-Linear Hyperbolic Equations and to Problems in Materials Science, PI, DoE, USA. 2008-2011.

MRI: Development of a Next-Generation Interactive Virtual Reality Display Environment for Sciences, Co-PI, NSF, USA. 2009-2013.

ICERM: Institute for Computational and Experimental Research in Mathematics, Co-PI, NSF, USA. 2010-2015.

HHMI Undergraduate Science Education Award, Co-PI, HHMI, USA. 2010-2012.

MURI: Multi-Scale Fusion of Information for Uncertainty Quantification and Management in Large-Scale Simulations. Co-PI, AFOSR, USA. 2009-2014.

Partnership for Edge Physics Simulation (EPSi), Co-PI, DoE, Fusion Science, USA. 2012-2014.

Discontinuous Galerkin Methods for Problems with Fractional Derivatives. PI, NSF, USA. 2011-2014.

High-order accurate numerical models for magma migration beneath the mid-ocean ridges: Geochemical consequences and geophysical implications, Co-PI, NSF, USA. 2012-2015.

Scalable high-order methods for multi-scale problems: Analysis, Algorithms, and Applications, PI, AFOSR, USA. 2012-2016.

ExaFlow, Co-PI, Horizon 2020. 2015-2018.

Next-generation maintenance planning and life assessment tool for large structures and machines, combining 3D physics, machine learning and big data, CTI, Switzerland. 2018-2020

Advanced computational methods for wave problems. PI, FNS, Switzerland. 2016-2019

Structure Preserving Reduced Order Modeling, PI, AFOSR, USA. 2017-2020

Conference support

Workshop on Advances and Challenges in Time-Integration of PDE's. Co-PI, AFOSR, USA. 2003.

International Conference on Spectral and High-Order Methods 2004 (ICOSA-HOM'2004). PI, DARPA/AFOSR, USA. 2003-2004.

7th International Conference on Mathematical and Numerical Aspects of Waves (WAVES'05), PI. AFOSR, USA. 2005.

7th International Conference on Mathematical and Numerical Aspects of Waves (WAVES'05), PI, NSF, USA. 2005.

Workshop on Advances and Challenges in the Solution of Stochastic Partial Differential Equations. PI, AFOSR, USA. 2005-2006.

International Conference on Spectral and High-Order Methods 2009 (ICOSA-HOM'2009). Co-PI, NSF, USA. 2008-2009.

International Conference on Advances in Scientific Computing; December 2009; Providence, RI, Co-PI, NSF, USA. 2009-2010.

International Conference on Advances in Scientific Computing; December 2009; Providence, RI, Co-PI, AFOSR, USA. 2009-2010.

Industry consulting

1996-2002 ICASE, NASA Langley Research Center, VA, USA.
1995-2001 Risø National Laboratory, Denmark.
2004-2006 TechX, Boulder, CO, USA.
2007-2011 Mathematical Systems and Solutions Inc., Pasadena, CA, USA.
2010-2011 COMSOL, Stockholm, Sweden.
2006-2013 HyperComp, Inc, Los Angeles, CA, USA.
2018-2023 Akselos SA, Lausanne, Switzerland.

Teaching and mentoring

Summer schools and mini courses

06/2000 *DCAMM Summer School 2000: Computational Aspects and Applications of Spectral Methods*. Main speaker. 22 international participants. Technical University of Denmark, Denmark.

02/2005 *Montreal Scientific Computing Days*. Main speaker. 80 participants. University of Montreal and McGill University, Montreal, Canada.

12/2005 *Discontinuous Galerkin Methods for Partial Differential Equations. I. A Mathematical Introduction*. Special one week intensive PhD-level course. 26 students. Technical University of Denmark, Denmark.

11/2006 *CEA-EDF-INRIA Winterschool in DG-FEM*, 50 participants. One of two main lectures at graduate/post graduate level. INRIA-Rocquencourt, France.

05/2006 *Discontinuous Galerkin Methods for Partial Differential Equations. II. A Practical Introduction*. Special one week intensive PhD-level course. 16 students. Technical University of Denmark, Denmark.

08/2007 *Simulation and Visualization of Fluid Phenomena*, Special two week intensive PhD-level course. 14 students. Technical University of Denmark, Denmark.

06/2008 *Rocky Mountain Mathematics Consortium Summerschool in Advanced Methods for Partial Differential Equations*. Main lecturer. 50 participants. Laramie, Wyoming, USA.

08/2009 *Discontinuous Galerkin Methods for Partial Differential Equations*. Special two week intensive PhD-level course. 25 students. Technical University of Denmark, Denmark.

06/2010 *Discontinuous Galerkin Methods for Partial Differential Equations*. Special two week intensive PhD-level course. 25 students. University of Santiago de Compostella, Spain.

08/2010 *Uncertainty Quantification in Computation Science*. Lecture series (four 90 min lectures) presented at the Technical University of Denmark, Denmark.

08/2012 *Discontinuous Galerkin Methods for Partial Differential Equations*. Special two week intensive PhD-level course. 15 students. Technical University of Denmark, Denmark.

04/2016 *Discontinuous Galerkin Methods*. PhD Winter School, KTH, Sweden.

08/2016 *Reduced order modeling of parameterized problems*. Lecture series (three 90 min lectures) presented at the Technical University of Denmark, Denmark.

11/2016 *Introduction to Uncertainty Quantification*, Lecture series (four 60 min lectures) presented at the Technical University of Denmark, Denmark.

09/2019 *Non-intrusive Reduced Order Modeling*, 2 lectures, at Reduced Order Modeling Summer School, Eindhoven, the Netherlands

03/2021 *Non-Intrusive Reduced Order Models using Physics Informed Neural Networks*, 2 lectures, TU/Delft, the Netherlands

Regular classes

Brown Univ AM34 Methods of Applied Mathematics II; AM117 Computational Linear Algebra; AM118 Numerical Methods for Differential Equations; AM255 Finite Difference Methods for Partial Differential Equations; AM256 Spectral Methods for Time-Dependent Partial Differential Equations; AM282 Topics Course: Numerical Solution of Ordinary Differential Equations: IVP Problems and PDE Related Issues.

EPFL MATH-101 Analysis I; MATH-106 Analysis II; MATH-351 Advanced Numerical Analysis; MATH-459 Numerical Methods for Conservation Laws.

Undergraduate mentoring

2002 **Anthony Giunta**, *An analysis of error in two-dimensional particle-tracking models*, Senior honors thesis, Applied Mathematics, Brown University, USA.

Kazutoshi Yamazaki, *A graphical interface for experimentation with dynamical systems*, Senior honors thesis, Applied Mathematics, Brown University, USA.

2012 **Jason Kaye**, *The Interpolation of Gravitational Waveforms*, Senior honors thesis, Applied Mathematics, Brown University, USA, Awarded the Provost's prize in recognition of outstanding honors thesis.

Michael Wagman, *Simulating Turdurckened Black Holes with a Discontinuous Galerkin Scheme*, Senior honors thesis, Applied Mathematics, Brown University, USA, Awarded the Mildred Widgoff Prize for Excellence in Thesis Preparation.

Frankie Camacho, *Compressed sensing for f-MRI*, Senior Honors Thesis, Applied Mathematics, Brown University, USA.

2013 **Elena Quierolo**, *Low rank approximations*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Aminian Bozorgmehr, *Reduced Order Modelling using a Greedy Approach applied to the Lorenz's Attractor*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2014 **Samira Amraoui**, *Topological optimization for conductive problems*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Seif Ben Bader, *2D Shallow water wave equation*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Signy Florent, *On the shallow water wave equation*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Jonathan Droxler, *Topological optimization for conductive problems*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Theo Galy-Fajou, *Split-Field PML Boundaries using the Discontinuous Galerkin Method*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Hugo Babel, *Solving the shallow water wave equation on GPU's*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Sebastian Bruggisser, *Fast simulation of hydrostatic incompressible flows*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Manuel Schmid, *Efficient solvers for systems of reaction-diffusion equations*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2015 **Lea Kissling**, *Uncertainty quantification of orbital trajectories using polynomial chaos*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2016 **Stefano Ubbiali**, *Two-dimensional adaptive WENO methods based on radial basis function reconstructions*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

WENO Method for 2D Euler Equations and Its CUDA Implementation, *Lie He*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2017 **Mariella Kast**, *Modeling of supercritical wave equations*, Semester project, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2019 **Maurice Amendt**, *Neural-network-induced Gaussian processes for multifidelity regression*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Jiahua Wu, *Inequality constrained problems using Gaussian process regression*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Emeric Sibieude, *Comparative study of several one-class classification methods for simulation-based anomaly detection and damage localization*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Andrew O'Sullivan, *Predictive Modeling of Dynamical Systems with Neural Networks*, Semester project, Institute of Mathematics, EPFL, Switzerland.

2020 **Marius Beaud**, *RBF based CWENO limiter on internal nodes for DG method*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Axel Dinh Van Chi, *Wetting/Drying treatment in the shallow water equations*, Bachelor project, Institute of Mathematics, EPFL, Switzerland.

Cédric Roy, *Sparse Neural Networks*, Bachelor project, Institute of Mathematics, EPFL, Switzerland.

Yiting Zhang, *Discovery of governing equations for scientific data via autoencoders*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Piere Vuillecard, *Detecting discontinuity orientation and location on two-dimensional grids using neural networks*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Raphael Attias, *Function approximation through neural netwroks*, Bachelor project, Institute of Mathematics, EPFL, Switzerland.

Céline Trottet, *Bayesian neural networks for active learning*, Semester project, Institute of Mathematics, EPFL, Switzerland.

2021 **Zilan Cheng**, *A hierarchical preconditioner for wave problems in heterogeneous media*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Andréa Dardenelli, *Symplectic Networks*, Semester project, Institute of Mathematics, EPFL, Switzerland.

2022 **Bruno R Carrillo**, *Effect of random parameters on model order reduction of coupled oscillatory systems*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Alex D Van Chi, *Helmholtz Equation and Neural Networks: A Study of VPINN*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Sepehr Mousavi, *Variational Physics-Informed Neural Networks For The Helmholtz Impedance Problem*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Lucas Crijns, *Efficient Approximations of the Poincaŕe-Steklov Operator*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Bruno Ploumhans, *Solving the half-wave maps equation using the Non-Uniform Fast Fourier Transform*, Semester project, Institute of Mathematics, EPFL, Switzerland.

David Mansour Nikravech, *A comparative study between two methods for reduction order modeling*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Philipp Weder, *Neural Network-POD for Domain Uncertainty Quantification in Acoustic and Electromagnetic Scattering*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Oisin Morrison, *Physics-Informed Neural Networks with Dynamical Low-Rank Approximations*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Bartul Kovacic, *Scalable Implementation of High-Order Entropy Stable Finite Difference Schemes*, Semester project, Institute of Mathematics, EPFL, Switzerland.

2023 **Leonardo Bruno Trentini**, *Reducing Graph Convolutional Auroencoders for Parametrized PDEs*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Francesco Sala, *Graph Neural Networks for learning latent dynamics*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Robin Mury, *Finite element method: Application of the variational multiscale method to the Convection-diffusion equation*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Otto Broers, *Artificial Neural Network and Bayesian Inversion Applied to the Helmholtz Equation*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Francesco Pettenon, *Enhancing Graph Autoencoder through Physics-Informed Loss*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Jonas Dammann, *Error Inhibiting Schemes for Block One-step methods*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Andreas Solheim, *Model order reduction for one-dimensional parameterized time-dependent PDEs using the Laplace transform*, Semester project, Institute of Mathematics, EPFL, Switzerland.

Ivan Bioli, *Multi-Fidelity Surrogate Modeling for Large-Scale Bayesian Inverse Problems using Artificial Neural Networks*, Semester project, Institute of Mathematics, EPFL, Switzerland.

MSc thesis advisor

1992 **Claus Bendtsen and Lars K. Lundin**, *Spectral Methods on a Massively Parallel Computer*, IMM, Technical University of Denmark, Denmark.

2012 **Allan S. Nielsen**, *Feasibility Study of the Parareal Algorithm*, DTU-Compute, Technical University of Denmark, Denmark.

2015 **Marco Sutti**, *Perfectly matched layers for the Boltzmann equation*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Manuel Schmid, *Resolution of the Gibbs Phenomenon for Navier-Stokes Simulations*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Caterina Bigoni, *Adaptive WENO methods based on non-polynomial reconstructions*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Boris Bonev, *Discontinuous Galerkin Methods for Shallow Water Equations*, Univ. Stuttgart, Mathematics, Germany.

Jonathan Droxler, *Computation of superlensing and cloaking using negative index metamaterials*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Gilles Brunner, *Optimizing the Parareal Method for Shallow Water Equations*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Kristian Berg Thomsen, *Multilevel algorithms for uncertainty quantification*, DTU Compute, DTU, Denmark.

2016 **Kilian Thomas**, *2D adaptive WENO methods based on RBF reconstructions*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Seif Ben Bader, *iCeBOUND Project - Porting a Solar Energy Potential Algorithm on GPU*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Stefano Guarino, *Spectral deferred correction methods for differential integral equations*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Bozorgmehr Aminian, *Drag prediction LEO satellites with artificial neural networks*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Dario Marvin, *Computational Modeling of Cloaking*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2017 **Stefano Ubbiali**, *Reduced order modeling of nonlinear problems using neural networks*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

Nicolo Ripamonto, *Energy-preserving model reduction of fluid flows*, Mathematics Institute for Computational Science and Engineering, EPFL, Switzerland.

2018 **Niccolo Discacciati**, *Artificial viscosity models through neural networks*, Institute of Mathematics, EPFL, Switzerland.

2019 **Mariella Kast**, *Multifidelity methods for reduced order modelling of nonlinear problems*, Institute of Mathematics, EPFL, Switzerland.

Andrea Romani, *Embedded WENO methods through neural networks*, Institute of Mathematics, EPFL, Switzerland.

Lukas Schwander, *Nonoscillatory Fourier spectral methods through neural networks*, CSE Program, ETHZ, Switzerland.

Maurice Amendt, *Multifidelity regression using artificial neural networks*, Institute of Mathematics, EPFL, Switzerland.

2020 **Rayan Elalamy**, *Acoustic analyzer in sports training*, Institute of Mathematics, EPFL, Switzerland.

Emeric Sibieude, *Machine learning applications for model selection in population pharmacokinetic modeling*, Institute of Mathematics, EPFL, Switzerland.

2021 **Andrew O'Sullivan**, *CFD Simulation of a Rotating Isolated Car Wheel with Smoothed Profile Method in Nektar++*, Institute of Mathematics, EPFL, Switzerland.

Agathe van Lamsweerde, *Parametric model order reduction and sensitivity analysis for the dynamics of circadian clocks*, Institute of Mathematics, EPFL, Switzerland.

Céline Trottet, *Modular Clinical Decision Support Networks*, Institute of Mathematics, EPFL, Switzerland.

Etienne Santi, *Numerical simulations for the 1-3D half-wave maps equation*, Institute of Mathematics, EPFL, Switzerland.

2022 **André a Dardanelli**, *Unsupervised default detection in the watchmaking industry using LSTM-based Auto-Encoder models*, Institute of Mathematics, EPFL, Switzerland.

Tyler John-Anselme Benkleylli, *Incorporating Geometric information into Physics-informed Neural Networks*, Institute of Mathematics, EPFL, Switzerland.

Louis Jaugey, *High-order accurate entropy stable discontinuous Galerkin schemes using artificial viscosity*, Institute of Mathematics, EPFL, Switzerland.

Filippo Zacchei, *Investigation of the Aerosol Evolution and Delivery into the Upper Airway under Transient Conditions*, Institute of Mathematics, EPFL, Switzerland.

2023 **Oisin Morrison**, *Learning operators through graph neural networks*, Institute of Mathematics, EPFL, Switzerland.

Matteo Calafa, *Numerical estimation of the back-ground pressure shift in the FoCS-2 fountain atomic clock*, Institute of Mathematics, EPFL, Switzerland.

Leonhard X. Driever, *Time-Based and Data-Driven Models for Fluid-Structure Interaction*, Institute of Mathematics, EPFL, Switzerland.

Lenonard Lechot, *Evolutional deep neural networks applied to the regularized lid-driven cavity flow : a positional embeddings approach*, Institute of Mathematics, EPFL, Switzerland.

Trad Yacine, *Application of Generative Adversarial Networks as an Economic Scenario Generator for Pricing Structured Products*, Institute of Mathematics, EPFL, Switzerland.

Bartul Kovacic, *GPU Accelerated Numerical Simulations of Hyperbolic Conservation Laws using Entropy Stable Schemes and Adaptive Moving Mesh Method*, Institute of Mathematics, EPFL, Switzerland.

PhD thesis advisor

1998 **Baolin Yang**, *Spectral Methods and Absorbing Boundary Conditions for Maxwell's Equations*, Division of Applied Mathematics, Brown University, USA.
First position: Researcher at Cadance Inc. USA.

2001 **Chun Hao Teng**, *Numerical Methods for Wave Problems in Complex Geometries*, Division of Applied Mathematics, Brown University, USA.
First position: Researcher at Taiwan National University, Taiwan, Taiwan.

2004 **Qianyong Chen**, *Topics in Spectral Methods*, Division of Applied Mathematics, Brown University, USA.
First position: Industrial postdoc at the Institute of Mathematics and its Applications (IMA), University of Minnesota and Exxon Corporation, USA.

2006 **Alex Kanevsky**, *Implicit-Explicit Runge-Kutta Methods for Fluid Flow Simulations*, Division of Applied Mathematics, Brown University, USA.
First position: Postdoctoral researcher at the Courant Institute of Mathematical Sciences, NYU, USA.

Laura Lurati, *Spectral Methods for Dealing with Uncertainty and the Gibbs Phenomenon*, Division of Applied Mathematics, Brown University, USA.
First position: Industrial Postdoctoral researcher at Boeing and the Institute of Mathematics and its Applications (IMA), University of Minnesota, USA.

Lucas Wilcox, *High-Order Accurate Methods for Solving the Time-Harmonic Maxwell's Equations*, Division of Applied Mathematics, Brown University, USA.
First position: Postdoctoral researcher and ICES Fellow, ICES, University of Austin, Texas, USA.

2008 **Sehun Chun**, *High-Order Accurate Methods for Solving Maxwell's Equations and their Applications*, Division of Applied Mathematics, Brown University, USA.
First position: Postdoctoral researcher at Imperial College, London, UK.

2009 **Akil Narayan**, *A Generalization of the Wiener Rational Basis Functions on Infinite Intervals*, Division of Applied Mathematics, Brown University, USA.
First position: Visiting Assistant Professor of Mathematics, Purdue University, IL, USA.

Alan Schiemenz, *Advances in the Discontinuous Galerkin Method: Hybrid Schemes and Applications to the Reactive Infiltration Instability in an Upwelling Compacting Mantle*, Division of Applied Mathematics, Brown University, USA.
First position: Postdoctoral researcher at Department of Geoscience, Brown University, USA.

2010 **Andreas Klöckner**, *High-performance high-order simulations of wave and plasma phenomena*, Division of Applied Mathematics, Brown University, USA.
First position: Postdoctoral researcher at the Courant Institute of Mathematical Sciences, NYU, USA.

2011 **Scott Field**, *Applications of Discontinuous Galerkin Methods to Computational General Relativity*, Division of Applied Mathematics, Brown University, USA, Awarded the Anthony Houghton Prize for Excellence in Theoretical Physics Graduate Studies.
First position: Postdoctoral researcher at the Department of Physics, University of Maryland, College Park, USA.

2012 **Kamaljit Chowdhary**, *Aleatoric and Epistemic Uncertainty Quantification/Sparse Gradient Image Recovery from Fourier and Edge Data*, Division of Applied Mathematics, Brown University, USA, Awarded the David Gottlieb Memorial Prize for Excellence in Graduate Studies.
First position: Postdoctoral researcher at Sandia National Laboratory, CA, USA.

Sheri Martinelli, *A Level-Sets-Based Wavefront Propagation Method for Underwater Acoustics*, Division of Applied Mathematics, Brown University, USA.
First position: Researcher at the Naval Underwater Warfare Center (NUWC), Newport, USA.

Paul Cazeaux, *Quelques modéles mathématiques homogénéisés appliqués á la modélisation du parenchyme pulmonaire*, University of Paris VI (UPMC) and Division of Applied Mathematics, Brown University, USA.
First position: Lecturer at University of Paris IV, Paris, France.

2013 **Xueyu Zhu**, *Reduced Basis Methods and Their applications*, Division of Applied Mathematics, Brown University, USA.
First position: Postdoctoral researcher at University of Utah, Utah, USA.

2014 **Seshu Turipathi**, *Discontinuous Galerkin Methods for Magma Dynamics*, Division of Applied Mathematics, Brown University, USA.
First position: Scientist, IBM Dublin, Ireland.

2018 **Allan S. Nielsen**, *Scaling and Resilience in Numerical Algorithms for Exascale Computing*, Institute of Mathematics EPFL, Switzerland.
First position: Startup company in Shenzhen, China

Babak Mouboudi Afkham, *Geometric Model Order Reduction*, Institute of Mathematics EPFL, Switzerland.
First position: Postdoctoral researcher at University of Stuttgart, Germany.

2020 **Caterina Bigoni**, *Numerical methods for structural anomaly detection using model order reduction and data-driven techniques*, Institute of Mathematics, EPFL, Switzerland.
First position: Research Scientist, INIAT, Switzerland

Fabian Mönkeberg, *High-order essentially nonoscillatory methods based on radial basis functions*, Institute of Mathematics, EPFL, Switzerland, Awarded as Best Thesis in Mathematics at EPFL, 2020.
First position: Software Engineer, Zeimer Ophyhalmic, Switzerland

Finnur Pind, *Wave-Based Virtual Acoustics*, DTU Compute, DTU, Denmark.
First position: CTO and Founder of Temple Acoustics, Iceland

2021 **Boris Bonev**, *Efficient algorithms for wave problems: Hierarchical preconditioners and Discontinuous Galerkin methods for the shallow water equations*, Institute of Mathematics, EPFL, Switzerland.
First position: NVIDIA, Zurich, Switzerland

2022 **Nicolo Ripamonti**, *Structure-preserving approaches and data-driven closure modeling for model order reduction*, Institute of Mathematics, EPFL, Switzerland.
First position: AMSL, Eindhoven, The Netherlands

2023 **Niccolo Discacciati**, *Reduced Order Models for Coupled Systems*, Institute of Mathematics, EPFL, Switzerland.
First position: Unknown

Current **Mariella Kast**, *2021-*, Institute of Mathematics, EPFL, Switzerland..

Noe Stauffer, *2023-*, Institute of Mathematics, EPFL, Switzerland..

Ramzi Sofiane Dakhmouche, *2023-*, Institute of Mathematics, EPFL, Switzerland..

Postdoctoral mentor

1999-2000 **Palle G Dinesen**, *Division of Applied Mathematics, Brown University, USA*.
Current position: CEO and co-founder, UbiqiSense Aps, Denmark.

1999-2001 **Tim Warburton**, *Division of Applied Mathematics, Brown University, USA*.
Current position: John K. Costain Faculty Chair in the College of Science, Professor of Mathematics, Virginia Tech, USA.

2001-2003 **Cedric Chauviere**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Maitre de Conference, Department of Mathematics, Université Blaise Pascal, Clarmont-Ferrand, France.

2003-2005 **Luke Olson**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Professor of Computer Science, University of Illinois, Urbana-Champaign, USA.

2003-2006 **Gustaaf Jacobs**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Professor of Mechanical Engineering, San Diego State University, San Diego, USA.

2005-2006 **Jeronimo Rodriguez**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Assistant Professor of Applied Mathematics, University of Santiago de Compostella, Spain.

2005-2006 **Eugene Kashdan**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Lecturer, University of Dublin, Ireland.

2006-2008 **Stephen F. Lau**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Associate Professor of Mathematics, University of New Mexico, Albuquerque, USA.

2007-2010 **Yanlai Chen**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Associate Professor of Mathematics, University of Massachusetts at Dartmouth, Massachusetts, USA.

2008-2010 **Benjamin Stamm**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Associate Professor of Mathematics, RWTH Aachen, Germany.

2008-2011 **Khosro Shahbazi**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Associate Professor of Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota, USA.

2010-2011 **Bin Zhang**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Staff scientist at Pacific Northwest National Laboratory (PNNL), WA, USA.

2010-2013 **Shun Zhang**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Assistant Professor of Mathematics, City University of Hong Kong, Hong Kong.

2012-2014 **Feng Chen**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Assistant Professor of Mathematics, Baruch City University of New York, NY, USA.

2013-2014 **Paul Cazeaux**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Assistant Professor of Mathematics, Kansas University, Kansas, USA.

2013-2014 **Salomon Janhunen**, *Division of Applied Mathematics, Brown University, USA*.
Current position: Staff scientist, Princeton Plasma Physics Laboratory (PPPL), Princeton, USA.

2013-2017 **Paolo Gatto**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Permanent researcher, University of Vienna, Austria

2013-2017 **Daniel Baffet**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Postdoctoral researcher, University of Basel, Switzerland.

2017-2019 **Deep Ray**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Postdoctoral researcher, University of Southern University, USA.

2017-2020 **Cecilia Pagliantini**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Assistant Professor, TU Eindhoven, Netherlands

2017-2020 **Mengwu Guo**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Assistant Professor, University of Twente, Netherlands

2017-2020 **Hossein Gorji**, *Institute of Mathematics EPFL, Switzerland*.
Current position:Staff Researcher, EMPA, Switzerland.

2018-2020 **Zhenying Zhang**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Industrial Researcher,

2019-2021 **Przemyslaw Zielinski**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Industrial Researcher, Leica, Switzerland

2017-2021 **Qian Wang**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Assistant Professor, Beijing Center for Scientific Computing, Beijing, PRC

2021-2023 **Ricardo Reyes**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Unknown

2021-2023 **Junping Duan**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Humboldt Research Fellow, Julius-Maximilians-Universitat Wurzburg, Germany

2021-2023 **Federico Pichi**, *Institute of Mathematics EPFL, Switzerland*.
Current position: Assistant Professor, SISSA, Triest, Italy

Current **Fernando Barraza Hernandez**, *2021-*, Institute of Mathematics EPFL, Switzerland.

Long term visiting students and researchers

Kim Dridi, *08/2000-02/2001*, Department of Electromagnetics, Technical University of Denmark, Denmark.

Jesper Grooss, *08/2002-02/2003*, Institute of Mathematical Modeling, Technical University of Denmark, Denmark.

Allan Peter Engsig-Karup, *08/2004-03/2005*, Department of Mechanical Engineering, Technical University of Denmark, Denmark.

Eivind Brodal, *07/2005-12/2005; 08/2006-12/2006*, Physics Department, University of Tromsø, Norway.

Stefan Engblom, *10/2006-06/2007*, Department of Scientific Computing, Uppsala University, Sweden.

Sabina Hoffmann, *10/2007-03/2008*, Department of Mathematics, University of Hamburg, Germany.

Arnel Tampos, *09/2008-12/2008*, Department of Mathematics, University of Philippines, Philippines.

Hendrik Riedmann, *04/2009-10/2009*, Department of Aeronautics, University of Stuttgart, Germany.

Andreas Stock, *04/2009-10/2009* , Department of Aeronautics, University of Stuttgart, Germany.

Meilin Liu, *09/2008 - 12/2009*, Department of Mathematics, Nanjing University of Aeronautics and Astronautics, China.

Gao Zhen, *09/2008 - 08/2010*, Department of Mathematics, Ocean University of China, China.

Prof. Weihua Deng, *09/2011-09/2013*, School of Mathematical Sciences and Computing Technology, Central South University, China.

Jens Zudrop, *03/2014-10/2014*, Computational Science and Engineering, RWTH Aachen, Germany.

Khemraj Shukla, *09/2014-05/2015*, Department of Geoscience and Geology, Boose Pickens School of Geology, Oklahoma State University, USA.

Rasmus Ellebæk Christensen, *09/2014-1/2015*, Section of Solid Mechanics, Technical University of Denmark, Denmark.

Martin Hess, *09/2014-11/2014*, Department of Mathematics, University of Madgeburg, Germany.

Wang Chen, *10/2014-9/2015*, Department of Aeronautics, Northwestern Polytechnic University, China.

Somayeh Yeganeh, *10/2015-04/2016*, Department of Mathematics, Isfahan University of Technology, Iran.

Lijing Zhao, *10/2015-10/2016*, Department of Mathematics, Lanzhou University, China.

Richard Grizivatz, *04/2016-09/2016*, Department of Mathematics, Ecole Centrale, Lyon, France.

Magnus Dam, *04/2016-08/2016*, DTU Physics, DTU, Denmark.

Prof. Jian Yu, *12/2016-12/2017*, Department of Aeronautics, Beihang University, China.

Mayha Hajihassanpour, *9/2017-3/2018*, Department of Aeronautics, Sharif University, Iran.

Fatemeh Mojarrad, *4/2018-10/2018*, Department of Mathematics, Ferdowsi University of Mashhad, Iran.

Ganesh Sundar Subramaniam, *4/2018-10/2018*, Department of Mechanical Engineering, RWTH Aachen, Germany.

Jim Magiera, *9/2018-12/2018*, Department of Mathematics, University of Stuttgart, Germany.

Mehran Mahdavi, *6/2018-2/2019*, Department of Aeronautics, Ferdowsi University of Mashhad, Iran.

Yi Qin, *11/2019-10/2020*, Department of Mathematics, Beihang University, China.

Prof. Taishan Zeng, *9/2019-8/2020*, Department of Mathematics, South China Normal University, China.

Dr. Chunyuan Lu, *9/2019-8/2020*, Guangdong Pharmaceutical University School of Medical Information Engineering Guangzhou, China.

Prof. Radu Cascaval, *9/2019-8/2020*, Department of Mathematics, University of Colorado at Colorado Springs, USA.

Dr. Federico Pichi, *2/2021-2/2022*, Mathematics Area, SISSA International School for Advanced Studies, Trieste, Italy.

Beatriz Moya Garcia, *9/2021-2/2022*, Aragon Institute of Engineering Research, Universidad de Zaragoza, Spain.

Nicola Rares Franco, *2/2022-4/2022*, Politecnico di Milano, Italy.

Enrico Manuzzi, *4/2022-6/2022*, Politecnico di Milano, Italy.

Service to home institution

Department service

Brown Univ Associate Department Chair, 2006-2010.

Member of Undergraduate Committee, 1999-2000.

Organizer of the Scientific Computing Seminars at the Division of Applied Mathematics, Brown University, 1998-2005.

Member of Graduate Committee, 2000-2005.

Member of Hiring Committee for position in Probability and Statistics, 2001-2005.

Member of Hiring Committee for position in Stochastic PDE's, 2006.

Member of Hiring Committee for position in Pattern Theory, 2008.

Chair of Computer committee, 2011-2013.

Member of the preliminary examination committee for the following PhD-students: Andrew Jones(1997), Chun-Hao Teng(1998), Mi-Sun Min(1998), Changqing Hu(1998), Sarah Dance(1998), Jae-hun Jung(1999), Jue Yan(1999), Yun Gao(1999), Gershom Kutlikoff(1999), Hui-Ming Pai(1999), Qian Yong Chen(2000), Didier Lucor (2002), Shanqin Shen (2002), Robert Strain (2002), Vasileios Symeonidis (2002), Jin Xu (2002), Sirod Sirosup (2003), Jennifer Libertini (2003), Eric Keaveny (2005), Dmitri Fedesov (2005), Xian Lou (2006), Guang Lin (2006), Nitsan Bengal (2006), Leopold Grinberg (2006), Tom Dean (2007), Kyongmin Yeo (2007), X. Zhong (2008), Siriu Tan (2008), James Nobel (2008), Sutee Olarnrithinun (2009), Dong Yi (2009), Sean Teller(2010), Viswanath Chinthapenta (2011), Peng Chen (2012).

Chair of the preliminary examination committee for the following PhD-students: Baolin Yang (1998), Chun-Hao Teng(2001), Alex Kanevsky (2001), Lucas Wilcox (2003), Laura Lurati (2003), Sehun Chun (2005), Akil Narayan (2005), Alan Schmienz (2006), Andreas Kloeckner (2007), Sheri Doran (2008), Kenny Chowdary (2008), Scott Field (2008), Xueyu Zhu (2009), Seshu Turipathi (2010).

Reader on PhD-thesis by: Changqing Hu(1999), Olga Lepsky(2000), Jing Shi(2001), Jue Yan(2002), Jamieson Moeser(2002), Robert M. Kirby (2002), Mi-Sun Min (2002), Kurt Sebastian (2003), Yongtao Zhang (2003), Jennifer Ryan (2003), Fengyan Li (2004), Qian Yong chen (2004), Sirod Sirosup (2004), Shanqin chen (2005), Zhang Xu (2005), Ching-Shan chou (2006), Ling Yuan (2006), Xialiang Wan (2007), Jingmei Qiu (2007), Wei Wang (2008), Leopold Grinberg (2009), Ishani Roy (2010), Xiangxiong Zhang (2011), Sirui Tan (2012), Xinghui Zhong (2012), Yang Yang (2013), Yifan Zheng (2013).

EPFL Member of Hiring Committee for position in Statistics, 2015-2017.

Member of the preliminary examination committee for the following PhD-students: Timothé e Pouchon (2014), V Sharma (2014), David Perraudin (2015), Pauline Ruegg-Reymond (2016).

Chair of the preliminary examination committee for the following PhD-students: Allan Nielsen (2014), Babak Maboudi (2015), Caterina Bigoni (2016), Fabian Monkeberg (2017), Boris Bonev (2018), Iryna Sivak (2018), Nicolo Ripamonti (2019).

Reader on PhD-thesis by: Peng Chen (2014), Claudia Maria Colciago (2014), Frederico Negri (2015), Viljami Laurmaa (2016). Davide Forti (2016), Petar Sirkovic (2016), Ondrej Budac (2016), Diane Guignard (2016), Viljami Laurmaa (2017), Elenora Musharbash (2017), Nicolo Dal Santo (2018), Ana Susnjara (2018).

Institutional service

Brown Univ Freshman/Sophomore academic advisor, 2000-2002.

Member (appointed) of Provost's hiring committee for director of CCV, 2004-2006.

Member (appointed) of Provost's committee on Science Cohort Initiative, 2005-2006.

Member (appointed) of Center for Computing and Visualization (CCV) Advisory and Oversight Board, 2004-2006.

Member (appointed) of University Committee of Undergraduate Science Education, 2006-2007.

Chair (appointed) of Working Group on Research Computing and Support for IT and Cyberinfrastructure 5-year planning for Central IT, 2008.

Co-chair (appointed) of Institutional Data Center Work Group, 2009-2010.

Member (appointed) of Institutional Research Data Work Group, 2009-2010.

Core member of proposal development team for NSF Mathematical Sciences Institute - ICERM 2008-2010.

Leading Infrastructure component and chair of research advisory group of IBM-Brown-RI Advanced Research Institute (OSCAR) development, 2008-2010.

Member (elected) of the University Resource Committee (URC), 2008-2011.

Member (elected) of the Academic Priorities Committee (APC), 2011-2013.

Member (appointed) of IT Advisor Board (ITAB), 2003-2005, 2006-2013.

Member (appointed) of Strategic Planning group for Research Computing and Support for IT and Cyberinfrastructure 5- and 10-year planning for Brown, 2011-2013.

Member (appointed) of Advisory Board for the Sheridan Center for Teaching Excellence, 2006-2011, Vice chair, 2011-2013.

Member (appointed) of the Presidents Science Advisory Council, 2009-2013.

EPFL Member (appointed) of the oversight board of campus wide IT, 2013-2015.

Member (appointed) of the advisory committee on high-performance computing (CoPil HPC), 2013-2018.

Member (appointed) of VPSI Direction, 2016-2017.

Member (appointed, chair) of the CoDir for SCITAS, 2018-2020.

Member (appointed) of the scientific advisory board of CECAM, 2018-2020.

Service to professional community

Advisory roles for government and interest organizations

2012 Representing Brown University at World Economic Forum (WEF), Davos, Switzerland.

Representing Brown University at Nordic Study Abroad Conference, Copenhagen, Denmark.

2018 Presentation to core leadership team of Ministry of Higher Education and Science, including the Minister of Higher Education and Science, on international models for university governance and talent development, Denmark.

Presentation to Danish Council for Innovation and Research (DFiR) on international models for career paths and talent development, Denmark.

Member of *Expert Commission on Research Financing*, Ministry of Higher Education and Science, Denmark.

2020 Member of *Task Force on Future Directions for the NSF in the Era of COVID-19*, SIAM, USA.

Major evaluations

T. Braun, J.S. Hesthaven, Håkan Håkansson, and C. Rolland, *Simula Research Laboratory: An Evaluation*, 2010, The Research Council of Norway, Norway.
ISBN: 978-82-12-02796-1

J.S. Hesthaven (chair), S. Albers, T. Braun, G. Gielen, T, Johansson, B. Pernici, and C. Rolland, *Research in Information and Communication Technology in Norway: An Evaluation*, 2012, The Research Council of Norway, Norway.
ISBN: 978-82-12-03052-7

J.S. Hesthaven (chair), A Barrow, K. Kanoun, J. Ott, *Simula Research Laboratory: An Evaluation 2016/2017*, 2017, The Research Council of Norway, Norway.
ISBN: 978-82-12-03584-3

A. Gornitzka (chair), J.S. Hesthaven, H. Foss Hansen, J. Wiborg Schneider, G. Sivertsen, *Fremtidssikring af Forskningskvalitet*, 2019, Ministry of Higher Education and Science, Denmark.
ISBN: 978-87-93807-04-4

Program evaluations

J.S. Hesthaven (chair), P. Acker, J. Alonso, A. Buffa, J. Burns, R. Eggels, T. Gallouet, J.L Guermond, G. Kristenssson, C.-D. Munz, M. Ruge, J. Shen and O. Widlund, *INRIA Research Theme I: Computational Models and Simulation: External Evaluation*, 2013, INRIA, France.

Serge Abiteboul (chair), Rina Dechter, Jan Hesthaven, Anne-Marie Kermarrec, Muriel Medard, Jean Walrand, *Report of the Scientific Advisory Board for Computer Science at UPMC*, 2016, Paris, France.

J.S. Hesthaven (chair),R. Donat,K.J. Evans, G. Evensen, H. Ammari, O. Ghattas, O. Ilev, S. Karni, J. Ostrowski, E. Risler, P. Vidstrand, B. Wingate, *INRIA Research Theme Earth, Environmental and Energy Sciences*, 2018, INRIA, France.

J.S. Hesthaven (chair), J. Kinnunen, E. McCoy, and M. Pingos, *Evaluation of educational programs in Mathematics and Statistics*, 2020, Cyprus Agency for Quality Assurance and Accreditation in Higher Education, Cyprus.

M. Brorson (chair), J.S. Hesthaven, J. Paltakari, and U. Jäglid , *Evaluation of educational programs Chemistry Engineering*, 2022, Technical University of Denmark, Denmark.

J. Brock (Chair), E. Pas, R. Tonner-Zech, J.S. Hesthaven, K. Willcox, S. Ananiadou, A. Bridge, *Evaluation of Heidelberg Institute of Theoretical Sciences (HITS)*, 2023, Heidelberg, Germany.

Evaluation panel member for funding agencies

US National Science Foundation; US Department of Energy; Science Foundation of Ireland, Norwegian Research Council; Agence Nationale de la Reserche, France; European Union, Brussels; Israel Science Foundation, Israel.

Award committees

SIAM IE Block lecture committee, SIAM, 2012-2014

SIAM Fellows committee, SIAM, 2015-2017

Dahlquist prize committee, SIAM, 2016

SIAM UQ Early Career Award committee (chair), SIAM, 2017-2018

SIAM CSE Early Career Award committee, SIAM, 2020

Leslie Fox Price, 2022-

Scientific conference committees

Scientific Committee of *6th International Conference on Mathematical and Industrial Aspects of Wave Propagation*, University of Jyvaskyla, Finland, 2003.

Member of Scientific Committee of *7th International Conference on Mathematical and Industrial Aspects of Wave Propagation*, Brown University, 2005.

Member of Scientific Committee of *1st Finite Element Methods in Engineering and Science (FEMTEC 2006)*, University of Texas, El Paso, 2006.

Member of Scientific Committee of *8th International Conference on Mathematical and Industrial Aspects of Wave Propagation*, Reading, UK, 2007.

Member of Scientific Committee of *2nd Finite Element Methods in Engineering and Science (FEMTEC 2008)*, University of Texas, El Paso, 2008.

Permanent Member of Scientific Committee of *International Conference on Spectral and High-Order Methods (ICOSAHOM)*, 2004-present. Committee chair, 2007-

Member of Scientific Committee of *8th International Conference on Mathematical and Industrial Aspects of Wave Propagation*, Vancouver, Canada, 2011.

Member of Scientific Committee of *9th International Conference on Mathematical and Industrial Aspects of Wave Propagation*, Tunis, Tunesia, 2013.

Member of Scientific Committee of *12th International Conference on Mathematical and Industrial Aspects of Wave Propagation*, Vienna, Austria, 2019.

Member of Scientific Board of *Mathematical and Scientific Machine Learning*, 2019-

Conference organization

2001 Co-organizer (w/ E. Michielssen, UIUC) of mini symposium *Time-Domain Solvers in Computational Electromagnetics: Trends and challenges*. SIAM Annual Meeting, San Diego, USA.

2003 Organizer (w/ C.W. Shu, M. Carpenter (NASA), and D. Gottlieb) of *Workshop on Advances and challengdes in Time-Integration of PDE's*. Brown University, USA.

2004 Organizer (w/ C.W. Shu, G. Karniadakis, and D. Gottlieb) of *6'th International Conference on High-Order and Spectral Methods (ICOSAHOM'04)*, Brown University, USA.

Organizer (w/ C.W. Shu, W. Cai, W.S. Don) of *International Conference on the Research Trend for PDE Modeling and Computation on the Occation of David Gottlieb's 60 Birthday*, Brown University, USA.

2005 Organizer (w/ C.W. Shu, D. Gottlieb, and P. Monk (U Delaware)) of *7'th International Conference Mathematical and Numerical Aspects of Wave Propagation (WAVES'05)*, Brown University, USA.

2006 Organizer (w/ P. Dupuis, B. Rozovski, and D. Gottlieb) of *Workshop on Advances and Challenges in the Solution of Stochastic Partial Differential Equations*, Brown University, USA.

2009 Organizer (w/ C.W. Shu and S. Gottlieb) of *International Conference on Advances in Scientific Computing in Memory of David Gottlieb*, Brown University, USA

2011 Organizer (w/ S. Field and S. Lau) of *Advances and Challenges in Computational General Relativity*, Brown University, USA.

2013 Organizer (w/ G. Karniadakis) of *International Symposium on Fractional PDEs: Theory, Numerics and Applications*, Salve Regina University, USA.

2016 Organizer (w/ F. Nobile and V. Panaretos) of *SIAM Conference on Uncertainty Quantification - SIAMUQ'16*, EPFL, Switzerland.

Organizer (w/ N. Marzari, L. Villard) of *Partnership in Advanced Scientific Computing - PASC'16*, EPFL, Switzerland.

2017 Organizer (w/ X. Li, C. Dawson and W. Schilders), *SIAM Computational Science and Engineering - CSE'17*, Atlanta, USA.

2019 Organizer (w/ G. Karniadakis) of *Scientific Machine Learning*, ICERM Hot Topic Workshop, Providence, USA.

External evaluator

2002 Richard Archibald, Department of Mathematics and Statistics, Arizona State University, USA. PhD-thesis.

Fredrik Edelvik, Department of Scientific Computing, Uppsala University, Sweden. PhD-thesis.

2004 David Fuhrman, Department of Mechanical Engineering, Maritime Engineering, Technical University of Denmark, Denmark. PhD-thesis.

Eugene Kashdan, Department of Applied Mathematics, Tel Aviv University, Israel. PhD-thesis.

Jan Martendal Rasmussen, Department of Mathematical Modeling, Numerical Analysis, Technical University of Denmark, Denmark. PhD-thesis.

2005 Julien Diaz, JJ Lions Laboratory, University of Paris VI, France. PhD-thesis.

Jesper Riishede, Center for Communication and Optical Materials, Technical University of Denmark, Denmark. PhD-thesis.

Eiving Brodal, Physics Department, University of Tromsø. Norway. MSc-thesis.

2007 Jean-Francoise Corbett, Department of Geophysics, University of Copenhagen, Denmark. PhD-thesis.

2008 Benjamin Stamm, Computational Mathematics, EPFL, Switzerland. PhD-thesis.

2009 Gregor Gassner, Department of Aeronautics, University of Stuttgart, Germany. PhD-thesis.

Frieder Lörcher, Department of Aeronautics, University of Stuttgart, Germany. PhD-thesis.

Xavier Ferrieres, Department of Mathematics, University of Paul Sabatier, France. Habilitation

Victorita Dolean, Department of Mathematics, University of Nice-Sophia Antipolis, France. Habilitation.

Marcel Bieri, Seminar for Applied Mathematics, ETHZ, Switzerland. PhD-thesis.

Jesper Sandvig Mariegaard, Department of Mathematics, Technical University of Denmark, Denmark. PhD-thesis.

2010 Timo Lähivaara, Department of Physics and Mathematics, University of Eastern Finland, Finland. PhD-thesis.

2011 Alexander Sinding, Faculty of Science, University of Paris-Dauphine, France. PhD-thesis.

Mohammad Shafique, Department of Mathematics, Gomal University, Pakistan. PhD-thesis.

2012 Muhammad Ishaq, Center for Advanced Studies in Pure and Applied Mathematics, Bahauddin Zakariya University, Pakistan. PhD-thesis.

Bettina Schieche, Department of Mathematics, Darmstadt University of Technology, Germany. PhD-thesis.

2014 Kristina Stieh, Department of Mathematics, University of Ulm, Germany. PhD-thesis.

Olga Mula Hernandez, JLL Laboratory, University of Pierre and Marie Curie, France. PhD-thesis.

2016 Martin Hess, Department of Mathematics, University of Magdeburg. Germany, PhD-thesis.

Okba Hamitou, Department of Geoscience, University of Grenoble, France. PhD-thesis.

2017 Denis Devaud, Department of Mathematics, ETHZ, PhD-thesis.

Ludovic Metivier, Department of Geoscience, University of Grenoble, France. Habilitation.

2018 Jakob Ameres, Department of Plasma Physics, Technical University of Munich, Germany. PhD-thesis.

2019 Maria Viega, Department of Mathematics, University of Zurich, Switzerland. PhD-thesis.

2020 Kenan Sehic, Scientific Computing, DTU-Compute, Technical University of Denmark. PhD-thesis.

Waseem Ahmad, Center for Advanced Studies in Pure and Applied Mathematics, Bahauddin Zakariya University, Multan, Pakistan. PhD-thesis.

Federico Pichi, Department of Mathematics, Scoula Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy. PhD-thesis.

Stefania Fresca, Mathematical Models and Methods in Engineering, Politecnico di Milano, Italy. PhD-thesis.

Editorial responsibilities

Editor-in-chief *SIAM Journal of Scientific Computing*, SIAM Publishing, Acting EIC 2015, EIC 2016-2021

Editor *Journal of Scientific Computing*, Kluver Publishing, 2003-

Communications in Computational Physics (CiCP), Global Science Press, 2007-

Journal of Computational Physics, Elsevier Publishing, 2012-

Computational Science and Engineering (CSE), SIAM Book series. 2014-

Communication on Applied Mathematics and Computation (CAMC), Springer Verlag, 2018-

Results in Applied Mathematics, Springer Verlag, 2018-

Philosophical Transactions A, Royal Society Publishing, 2020-

Previous *Open Applied Mathematics Journal (OAM)*, Bentham Science Publishers, 2006-2010.

International Journal of Computing Science and Mathematics, Inderscience Publishers, 2006-2010.

Mathematical Modelling and Applied Computing (MMAC), Research India Publications, 2006-2010.

Advances in Mathematical Physics, Hindawi Publishing Corporation, 2008-2010.

Advances in Numerical Analysis, Hindawi Publishing Corporation, 2008-2010.

Applied Mathematics and Computation, Elsevier Publishing, 2008-2011.

SIAM Journal of Scientific Computing, SIAM Publishing, 2005-2015.

BIT Numerical Mathematics, Springer Verlag, 2010-2018.

Proceedings of the Royal Society A: Mathematical,Physical and Engineering Sciences, Royal Society Publishing, 2014-2019.

Calcolo, Springer Verlag, 2016-2019.

Mathematical Modeling and Numerical Analysis (M2AN), ESAIM, 2008-2020.

Advanced in Computational Mathematics, Springer Verlag, 2014-2020.

Numerische Mathematik, Springer Verlag, 2018-2020.

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