GEORGE EM KARNIADAKIS, PROFESSOR

Division of Applied Mathematics & School of Engineering, Brown University, Providence, RI 02912
george_karniadakis@brown.edu ⋄ h-index: 126 ⋄ citations: > 75,000 ⋄ Google Scholar Profile ⋄ Research Webpage

DEGREES

- PhD, Massachusetts Institute of Technology, 1987.
- Master of Science, Massachusetts Institute of Technology, 1984; (Bodossaki Foundation Fellow)
- Batchelor's degree, National Technical University of Athens, 1982 (Honors)

POSITIONS HELD SINCE OBTAINING FIRST DEGREE

- January 2021-present: Charles Pitts Robinson and John Palmer Barstow Professor of Applied Mathematics and Engineering.
- July 2013 -present, Charles Pitts Robinson and John Palmer Barstow Professor of Applied Mathematics, Brown University; also, PNNL Research Scientist (part time, 2012-present).
- Sept. 2000 -present: Visiting Professor/Senior Lecturer/Research Scientist, MIT (Ocean/Mechanical Engineering).
- July 1996 -2013, Professor, Division of Applied Mathematics, Brown University.
- Jan. 1994 -June 1996, Associate Professor, Division of Applied Mathematics, Brown University.
- Fall quarters 2007 2013: Visiting Professor, College of Engineering, Peking University.
- Spring quarter 1993: Visiting Professor, Dept. of Aeronautics and Applied Mathematics, Caltech.
- Sept. 1988 -Dec. 1993: Assistant Professor, Dept. Mechanical and Aerospace Engineering, Princeton U.; also Associate Faculty of the Program in Applied and Computational Mathematics.
- April 1988 -August 1988: Research Associate, MIT; Advisor: A.T. Patera.
- Sept. 1987 -March 1988: Research Fellow at the Center for Turbulence Research at Stanford U./NASA Ames Research Center; Advisors: P. Moin and J. Kim.
- June 1987 -August 1987: Lecturer, Dept Mechanical Engineering, MIT.
- July 1984 -May 1987: Research Assistant, MIT; Advisors: A. T. Patera and B.B. Mikic.
- Jan. 1983 -June 1984: Research Assistant, MIT; Advisor: W. Unkel.
- June 1982 -Dec. 1982: Research Assistant, National Technical University of Athens; Advisor: T. Loukakis.

HONORS

- Vannevar Bush Faculty Fellow, 2022.
- Member of National Academy of Engineering, 2022.
- SIAM/ACM Prize in Computational Science and Engineering, 2021.
- American Association for the Advancement of Science (AAAS) Fellow, 2019.
- Alexander von Humboldt award, 2017.
- SIAM Computational Science and Engineering, best poster award, 2017.
- ICFDA'16 Riemann-Liouville award for best paper, 2016.
- ICMMES-MDPI best poster award, 13th Int. Conf. for Mesoscopic Methods, July 2016.

- SIAM Ralph E. Kleinman Prize, 2015.
- Wierderhielm Award, most cited original paper in "Microcirculation" for five years, 2015
- US Association of Computational Mechanics, (inaugural) J. Tinsley Oden Medal, 2013.
- US Association of Computational Mechanics, 2007 Computational Fluid Dynamics award.
- Fellow of the Society for Applied and Industrial Mathematics (SIAM), 2010-.
- Fellow of the American Physical Society (APS), 2004-.
- Fellow of the American Society of Mechanical Engineers (ASME), 2003-
- Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA), 2006-.
- 17th Robert Bruce Wallace Lecture award, MIT, 2003.
- Rheinstein junior faculty award, Princeton University, 1992.
- DOE/SCIDAC visualization award, 2011, (with ANL researchers).
- Finalist, Gordon Bell Prize, Supercomputing'11, (with Grinberg, Morozov, et al.).
- Finalist, Gordon Bell Prize, Supercomputing'15, (with Koumoutsakos et al.).
- Best poster in Supercomputing'08 (with L. Grinberg, J. Cazes) on "A Scalable Domain Decomposition Method for Ultra-Parallel Arterial Flow Simulation, SC08, Austin, TX, November 2008.

PATENTS

- G.E. Karniadakis and L. Lu, "Learning nonlinear operators via DeepOnet", Brown University, May 2021.
- Y. Deng, L. Lu, C. Mantzoros and G.E. Karniadakis, "Methods, systems and apparatuses for improved deep learning predictions of diabetic events, VA ID 2020-553) (37759.0353U1), April 2021.
- S. Suresh, L. Lu, M. Dao and G.E. Karniadakis, "Solving Inverse Indentation Problems via Deep Learning with Applications to 3D Printing and Other Engineering Projects", (NTU Ref: 2019-140) - June 24, 2019.
- M. Raissi, P. Perdikaris and G.E. Karniadakis, Physics Informed Learning Machine, Patent No. 10,963,540, March 30, 2021.
- G.E. Karniadakis and Y. Du, "Method and Apparatus for Reducing Turbulent Drag", Patent No. 6,333,593 B1, Dec 25, 2001.
- G.E. Karniadakis, K. Breuer and V. Symeonidis, "Method and Apparatus for Reducing Turbulent Drag (continuing part)", Patent No. 6,520,455 B2, Feb. 18, 2003.
- C. Chryssostomidis, D. Sura, G.E. Karniadakis, C. Jaskolski, R. Kimbal, "Lorentz Acoustic Transmitter for Underwater Communications", Patent No. 7,505,365, March 17, 2009.

CONSULTING EXPERIENCE

- Cooling of electronic components (AT T Bell Labs, Fujitsu Ltd.), Modeling of heat exchange in automobiles (GM Corp.), Unsteady piston flows (CTI-Cryogenics), flow through pumps (EDO Co.), Design of novel aluminum furnaces (ALCAN Can. Labs), Mass transfer in paper-making (Union Camp) Combustion (Sandia Labs), Noise prediction and jet flows (AeroChem Labs, Inc.), Crystal growth (G.E. Co.), Bio-fluids (Allied), Boiler fouling (AVCO Res. Labs), Prediction of by-pass transition (NASA Lewis), Applied numerical methods (Nuclear Regulatory Commission), Fow-structure interactions (Norsk Hydro), Ocean Power Technology (energy-harvesting eel), Chevron (modeling

of risers), PCMC, Inc. (microfluidics/turbulence), United Technologies (uncertainty quantification), DeepStar (vortex-induced vibrations of risers), Quantum Ventura (machine learning), Cummins (machine learning), Intelligent Automation (machne learning), Front End Analyitics (machine learning), Anailytica (machine learning).

INVITED/KEYNOTE SEMINARS

University of Arizona, 1987; Brown University, 1987; Yale University, 1987; Johns Hopkins, 1987; Columbia University, 1987; Princeton University, 1987; Tufts University, 1987; Carnegie Mellon University 1987; UCSD, 1987; Caltech, 1987; Stanford University, 1987; Nasa Ames, 1987; University of Illinois at Urbana-Champaign, 1987; Stanford University, 1988; MIT, 1988; Princeton University, 1988; Nasa Langley, 1989; Naval Research Laboratory, 1989; University of Delaware, 1990; Brown University, 1990; Nasa Lewis, 1991; University of North Carolina, 1991; MIT, Sea Grant, 1991; CCNY, Levich Institute, 1991; Lehigh University, 1991; Naval Research Laboratory, 1991; Princeton, PPL, 1991; University of Colorado, Boulder, 1991; ICFD, Tokyo, 1991; Von Karman Institute, 1992; Sydney University, 1992; Melbourne University, 1992; CSIRO, course on CFD, 1992; Brown University, 1992; Wright Patterson Air Force Base, 1992; Princeton University, 1993; Yale University, 1993; INRIA, course on CFD, 1993; NSF, 1993; Caltech, 1993; ETH-Zurich, 1993; Clarkson University, 1993; Rutgers University, 1993; Brown University, 1994; IBM, 1994; MIT, 1994; PSC/Carnegie Mellon, 1995; University of Rhode Island, 1995; Boston University, 1995; Virginia Polytechnic Institute, 1995; Hong Kong University, 1995; Institute for Scientific Computing, Chinese Academy of Sciences, 1995; University of Tokyo, 1995; University of Notre Dame, 1995; Cornell Theory Center, 1995; MIT, 1996; CCNY, Levich Institute, 1996; UC Santa Barbara, 1996; Wright Patterson Air Force Base; AFOSR,Boiling Air Force Base, 1996; Nuclear Regulatory Commission, 1996; National Institute of Standards and Technology, 1996; AIAA 1996; University of Rhode Island, 1996; University of Maryland, 1996; University of Cincinnati, 1997; Worcester Polytechnic Institute, 1997; Penn State University, 1997; MHD Workshop, Dresden, Germany, 1997; First AFOSR Conference on DNS/LES, 1997; ASME Heat Transfer Conference, 1997; 10th Domain Decomposition Conference, 1997; 10th International Symposium on Unmanned Untethered Submersible Technology, 1997; Cornell Workshop on POD-Galerkin Models for the Dynamics and Control of Complex Flows, 1997; University of Michigan, 1997; AFOSR/Princeton Workshop, 1998; DOE/Oakridge Workshop, 1998; DARPA/NUWC Workshop, 1998; NSF Workshop, 1998; AIAA Fluid Dynamics Conference, 1998; DARPA/ONR Meeting, 1998; SIAM Symposium, 1998; ICOSAHOM'98 Symposium, 1998; ASME/FED, 1998; 30th Anniversary Japanese Society of Fluid Mechanics, 1998; University of Tokyo, 1998; Turkey Workshop on DNS/LES; ECCOMAS Symposium, 1998; University of Bergen, 1998; NCSA/NSF Meeting, 1998; Norsk Hydro, 1998; Caltech Symposium on Validation and Verification, 1998; Argonne National Labs, 1999; Boston University, 1999; Los Alamos 1999; University of Texas A M, 1999; American Physical Society, 1999, Los Alamos, 1999; DeepStar/BP Amoco Workshop, 1999; MIT, 2000; Woods Hole Oceanographic Institute, 2000; JASON, 2000; SUNY/Buffalo, 2000; University of Pennsylvania, 2001; Modeling Simulation of Microsystems, 2001; AFOSR Uncertainty Workshop, 2001; Nasa Langley/ICASE, 2001; ECCOMAS, 2001; DARPA Microfluidics Workshop, 2001; TAICDL, 2001; DoD/DOE/NASA Mission Computing Conference, 2002; Northwestern University, 2002; WPI, 2002; MIT, 2002; BBVIV3, 2002; Wallace Lecture MIT, 2003; CSE-UIUC, 2003; WE-Heraeus-Seminar, Bad Honnef, 2003; Imperial College, 2003; Los Alamos, 2004; University of Pittsburgh, 2004; University of Tokyo, 2004; CFD2004 Canada, 2004; Johns Hopkins University, 2004; University of Rhode Island, 2004; Tufts University. 2004; University of Houston, 2005; Texas AM University, 2005; University of Oklahoma, 2005; Oklahoma State University, 2005; 8th US National Congress on Computational Mechanics, 2005; ECCOMAS/Coupled Problems, 2005; HERCMA, 2005; NSF, 2005; Levich Institute, 2005; Northwestern University, 2006; University of Notre Dame, 2006; Illinois Institute of Technology, 2006; University of Illinois, Urbana-Champaign, 2006; Purdue University, 2006; ARO, North Carolina, 2006; Clemson University; University of Massachusetts; IUTAM General Assembly, 2006; Caltech, 2006; Tsinghua University, 2007; Peking University, 2007; Chinese Academy of Sciences (Institutes of Mechanics and of Scientific Computing), 2007; Shanghai University, 2007; Georgia Tech, 2008; Louisiana State University, 2008; Israel Symposium on Computational Mechanics, 2008; Tel-Aviv University, 2008; The Institute of Cyprus, 2008/2009; University of North Carolina, 2009; University of Minnesota (Straub lecture), 2009; FDA/NIH/NSF Workshop, 2009; MIT, 2009; NIH Workshop, 2010;

NASPDE/Freiberg, 2010; Multiscale workshop/ETH, 2010, 6th ICCFD, 2010; IUTAM-BLUBOF, 2011; SCPDE, 2011; Isaac Newton/WIMCS, 2011; von Neumann Symposium/AMS, 2011; ECCOMAS Coupled Problems, 2011; International Symposium on UQ, 2011; 4th- SCPDE, 2011; MNF, 2011; Shanghai Jiao Tong University, 2011; Fudan University, 2011; Stanford University, 2012; University of British Columbia, 2012; University of Washington, 2012; Pacific Northwest National Lab, 2012; NENAD, 2012; INRIA, 2012; City University London, 2012; Engineering Mechanics/ASCE, 2012; University of Nebraska, 2012; Instituto Superior Tecnico, Lisbon, 2012; National University of Singapore, 2012; Xiamen University, 2012; Northwestern University, 2013; Lorenz Center, The Netherlands, 2013; Duke University, April 26; IEEE HiCOMB/IPDPDS, Cambridge, USA, 2013; Int. Symposium on Modeling of Physiological Flow, Cagliari, Italy, 2013; ASME 2013 Fluids Engineering Division Summer Meeting Lake Tahoe, NV, 2013; SIAM Annual Meeting, San Diego, CA, 2013; USNCM12, Raleigh, NC, 2013; DOE Applied Math Program Meeting Albuquerque, NM; 2013; Louisiana State University Baton Rouge, LA, 2013; Fractional Calculus, Probability and Non-local Operators: Application and Recent Developments, Bilbao, Spain, 2013; Chinese Academy of Sciences, 2013; Int. Workshop on High Dimensional Data Approximation Sun Yat-sen University Gungzhou, China, 2013; Shanghai University, 2013; Southeast University, 2013; Hohai University, 2013; Tsinghua University, 2013; INRIA, Bordeaux, 2013; TU Munich, 2014; ETH, Zurich, 2014; University of Colorado, 2014; Princeton University, 2014; Penn State University, 2014; APS/DFD, 2014, ECCOMAS/UNCECOMP 2015; ICMMES 2015; Purdue University 2015; Notre Dame 2015; ECCOMAS 2016; IMACS 2016; Peking University 2016; Chinese Academy of Sciences 2016; Tsinghua University, 2016; NIH, 2017; 5th CMBE 2017; U Michigan 2017; John Hopkins University, 2017; Bates College, 2017; Jinan Supercomputing Center, 2017; Beijing Normal University, 2017; Peking University, 2017; Tsinghua University, 2017; Chinese Academy of Sciences, 2017; Beijing Computational Science Research Center, 2018; Purdue University, 2018; Harvard University, 2018; MIT, 2018, Stanford University, 2018; TU Munich, 2019; Northwestern University, 2019; Korean SIAM, 2019; UNCECOMP 2019; FrontUQ2019, 2019; ML-Helio, 2019; NTU, Singapore 2020; NSF/SMU, 2020, ANSYS, In, 2020; Los Alamos National Lab, 2020; ETH (2020); Politecnico di Milano, 2020; UC Berkeley SciDL, 2020; Princeton MSML, 2020; Siemens, 2020; KDD2020; U Chicago, Army Workskop, 2020; UCI, 2020; RWTH Aachen University, 2020; University of Texas, Austin, 2020; University of Washington, 2020; University of Utah, 2020; StonyBrook, 2020, Siemens, 2020; University of Torino, 2020; IIT Roorkee, India, 2020; KDD, 2020; Springer Nature, 2020; Columbia, 2021; UMass Amherst, 2021; University of Iowa, 2021; Bosch, 2021; Hitachi, 2021; SIAM CSE, 2021; DOE/AIRES, 2021; One Nonlocal World, 2021; NIT Rorkela, 2021; AI Con, 2021; Princeton PPL, 2021; Free University of Berlin 2021; U Cambridge, 2021; ETH, 2021, Texas AM, 2021; SMB, 2021; Siemens, 2021; University of Wisconsin; ICERM, 2021; Los Alamos, 2021; CMBC21, 2021; Symposium on Computer Animation, 2021; KGML2021, 2021; INI, 2021; LLNL, 2021; Journal of Computational Physics, 2021; Duke, 2021; Caltech, 2021; IBM, 2021; KAIST (Korea), 2021; TU Graz (Austria), 2021; ExxonMobil, 2022; Shell, 2022; 3M, 2022; Aspen, 2022; Imperial College; University of Colorado, 2022; University of Minnesota, 2022; KAUST, 2022; DTU, 2022; ECCOMAS, 2022; Tufts, 2022; Peking University, 2022; Tsinghua University, 2022.

COMMITTEES AND CONFERENCE ORGANIZATION

- Associate Editor of Computer Methods in Applied Mechanics and Engineering, 2021-;
- Associate Editor of Journal of Computational Physics, 2006-;
- Associate Editor of Biomechanics and Modeling in Mechanobiology.
- Associate Editor of Calcolo, 2015-2018;
- Associate Editor of SIAM Journal on Scientific Computing, 2017-;
- Associate Editor of SIAM Reviews, 2017-
- Associate Editor of SIAM J. Uncertainty Quantification, 2018-
- Associate Editor of Mathematical Models and Methods in Applied Sciences, 2017- 2018:
- Associate Editor of Acta Mechanica Sinica, 2004 -;

- Associate Editor of J. Fluids Engineering, 1993-96; 2000-2003;
- Member of the APS Cyberfluids Committee (2008 -2010).
- Member of Scientific Committee of the annual SIAM conference (2004).
- Scientific Committee of International Conference on Transport Phenomena in Micro and Nanodevices, (2004).
- Member of Scientific Committee of FIV2004/FIV2008 conferences (2004/2008).
- Member of Scientific Committee of BBVIV3 Conference on Wakes 2002/2005;
- Member of Scientific Committee of IUTAM Conference on Unsteady Flows 2002;
- Member of Scientific Committee of FEM in Flow Problems 2000;
- Member of Scientific Committee of IUTAM Conference on Wakes 2000;
- Member of Scientific Committee of ICOSAHOM, 1998 -present.
- Member of Scientific Committee of 1st-3nd AFOSR Conferences on DNS/LES, 1997, 1999, 2001.
- Member of Scientific Committee of 11th International Parallel Processing Symposium, 1997;
- Member of Scientific Committee of 2nd International Colloquium on Bluff Body Aerodynamics and Applications, Melbourne, 1992;
- Member of the Editorial Board for the Computational Fluid Dynamics Journal, 1992-;
- Member of the Editorial Board for the International Journal of Computational Engineering Science, 2005-;
- Member of the Editorial Board for Communications in Computational Physics, 2005-;
- Member of the Editorial Board for International Journal for Uncertainty Quantification, 2010-;
- Member of the Editorial Board for Computer Methods in Applied Mechanics and Engineering (CMAME), 2010-;
- Member and chairman of the Peer Review Board of NSF (PSC/NCSA) supercomputing Centers, 1993-96;
- Member of the Users Advisory Board for Supercomputing: NCSA, 1998-; PSC; 2000-. NPACI Allocations Committee: 2001-;
- Member and chair of the Teragrid NSF panel 2000-04;
- Member of the WTEC panel to evaluate the status of computational science, 2007-2008;
- Member of the Editorial Board of "M2AN (Mathematical Modeling and Numerical Analysis)," 2008-2012;
- Member of the Editorial Board of "Biomechanics and Modeling in Mechanobiology," 2016-;
- Member of the Editorial Board of "Calcolo", 2016-;
- Member of the Editorial Board of "Stochastics and Partial Differential Equations", 2014.
- Co-Organizer of the SIAM minisymposium on Fractional PDEs, Boston, July 11-15, 2016.
- Co-Organizer of the First International Workshop on DPD, September 21-23, 2015.
- Co-Organizer of the ICIAM-2015 minisymposium on Fractionals PDEs, Beijing, August 10-14, 2015.
- Co-Organizer of the first SIAM minisymposium on Fractional PDEs, Chicago, July 7-11, 2014.

- Organizer of the first "International Symposium on Fractional PDEs: Theory, Numerics and Applications", June 3-5, 2013.
- Organizer of Workshop on "Peridynamics, Dissipative Particle Dynamics and the Mori-Zwanzig Formulation", April 10- 11, 2011.
- Co-organizer of the ICERM Workshop on Uncertainty Quantification, October 9-12, 2012.
- Chief Organizer of ICOSAHOM'04, June 2004 (with Gottlieb, Shu Hesthaven).
- Organizer of Symposium on Microfluidics, WCCM V, July 2002 (with N. Aluru).
- Organizer of Symposium on Instability/Transition, IUTAM, April 2002.
- Organizer of Symposium on Microfluidics, AIAA, January 2001 (with A. Beskok).
- Organizer of Symposium on FEM LES, FEM 2000, April 2000, Austin, TX.
- Organizer of "International Symposium of Discontinuous Galerkin Methods", May 24-26, 1999, Newport, RI (with C.-W. Shu and B. Cockburn).
- Organizer of Symposium on "High-Order Methods for Compressible Flow Calculations", SIAM Conference, Stanford University, July 1997 (with C.-W. Shu);
- Organizer of ONR Workshop on "Flow/Wave-Structure Interactions", Brown University, June 1997 (with T.F. Swean);
- Organizer of Symposium on "HP/Spectral finite elements in computational mechanics" ICES'95, July 30-August 3,1995, Mauna Lani, Hawaii, (with B. Guo);
- Organizer of International Symposium on "Parallel Computing for Multi-phase Flows", ASME, Chicago, November 1994 (with S. Kim and M. Vernon);
- Organizer of Symposium on "Spectral Methods and Applications", 2nd U.S. National Congress on Computational Mechanics, Washington, D.C., August 1993;
- Organizer of Symposium on "High-Order Schemes for Shock Wave Calculations", SIAM Conference, July 1993 (with C.-W. Shu);
- Organizer of Symposium on Theoretical and Computational Fluid Dynamics, 29th Annual Meeting of the Society of Engineering Science at UCSD, La Jolla, September 1992 (with C. Pozrikidis and Y. Kevrekidis);
- Organizer of Symposium on "Parallel Aspects of High-Order Method", ICOSAHOM, Montpellier, June 1992;
- Organizer of DARPA-ONERA USA-French Conference on "Wavelets and Turbulence", Princeton, June 1991;

RESEARCH ACCOMPLISHMENTS

- Development of physics-informed learning machines – deep learning (PINNS and DeepOnet)
- Fractional Sturm-Liouville theory and first three-dimensional realistic simulations using fractional PDEs.
- Development of generalized Polynomial Chaos and Uncertainty Quantification.
- First simulation of the human arterial tree on the Teragrid.
- Development of generalized polynomial chaos methods for modeling uncertainty in unsteady flows.
- First direct (DNS) and large-eddy simulation (LES) of turbulence in complex geometries.
- First theoretical/numerical work on gas micro-flows.

- Discovery of secondary instability/transition in wake flows.
- Discovery of a new drag reduction technique using electromagnetic forcing (two patents).
- Development of high-order methods on unstructured meshes.
- Development of high-order discontinuous Galerkin methods for compressible/supersonic flows.
- Development of a new expansion basis: Singular Stokes eigenfunctions.

Work featured on the covers of:

- Physics Today (March 1993);
- Parity (Japanese -November 1993);
- Scientific Computing & Automation (June 1994),
- MHPCC'97 (November 1997),
- ACCESS/NCSA (November 1998),
- Cover of Book on "Recent Advances in DNS and LES" (Kluwer, 1999);
- Work featured in Science and reports in New Scientist,
- Industrial Physicist, and several popular magazines/newspapers around the world;
- Aerospace America (2001);
- NCSA Access (2002) and on Power Wall in SC'02,
- Cover of Phys. Rev. Lett. (2004);
- NCSA Access (2006)
- Biophysics Journal, (2017)
- Discover (2020)
- Interface (2021)

PUBLICATION LIST

(* indicates a PhD student supervised by George Em. Karniadakis)

A1. Books:

1. Z. Zhang* and G.E. Karniadakis, "Numerical Methods for Stochastic PDEs with White Noise", Springer, Applied Mathematics Series, 2017.
2. G.E. Karniadakis, A. Beskok* and N. Aluru, "Microflows and Nanoflows: Fundamentals and Simulation, Springer 2005.
3. G.E. Karniadakis and R.M. Kirby*, "Parallel Scientific Computing in C++ and MPI", Cambridge University Press, March 2003.
4. G.E. Karniadakis and A. Beskok*, "Microflows: Fundamentals and Simulation", Springer, 2001. (first textbook/monograph in this field).
5. G.E. Karniadakis S.J. Sherwin*, "Spectral/hp Element Methods for CFD," Oxford University Press, New York, 1999. (first monograph in this field); second edition, Oxford, 2005; third edition, 2013.

A2. Chapters in Books/Special Issues

1. G. Pang, G. E. Karniadakis, Physics-Informed Learning Machines for Partial Differential Equations: Gaussian Processes Versus Neural NetworksSpringer, Emerging Frontiers in Nonlinear Science pp 323-343, https://doi.org/10.1007/978, May 2020.
2. Handbok of Fractional Calculus with Applications, vol. 3, Numerical Methods, Editor G.E, Karniadakis, De Guyter, 2019.
3. WK Liu, G Karniadakis, S Tang, J Yvonnet, A computational mechanics special issue on: data-driven modeling and simulation-theory, methods, and applications, Computational Mechanics 64 (2), 279-279, 2019.
4. Y. Yu, R.M. Kirby, G.E. Karniadakis, Spectral Element and hp Methods, Encyclopedia of Computational Mechanics Second Edition, 1-43.
5. Z. Li, X. Bian, X.J. Li, M.G. Deng*, Y.H. Tang*, B. Caswell and G.E. Karniadakis, "Dissipative Particle Dynamics: Foundation, Implementation and Applications", In book: Particles in Flows, Editor: T. Bodnár, G.P. Galdi and Š. Nečasová, Birkhäuser, Cham, 2017.
6. L. Xuejin, L. Zhen, X. Bian, M. Deng*, C. Kim*, Y. Tang*, A. Yazdani, G.E. Karniadakis,"Dissipative Particle Dynamics, Overview," Encyclopedia of Nanotechnology, 2016.
7. G.E. Karniadakis, J.S. Hesthaven, I. Podlubny, Special Issue on "Fractional PDEs: Theory, Numerics, and Applications," J. Comput. Phys. 293, 1-3, 2015.
8. L. Grinberg*, M. Deng, A. Yakhot and G.E. Karniadakis, "Window Proper Orthogonal Decomposition: Application to Continuum and Atomistic Data", Reduced Order Methods for Modeling and Computational Reduction, Springer, vol. 9, eds. A. Quarteroni and G. Rozza, p. 275, 2014.
9. D.A. Fedosov*, I.V. Pivkin, W. Pan*, M. Dao, B. Caswell and G.E., Karniadakis, "Multiscale modeling of hematologic disorders", in Modeling of Physiological Flows edited by D. Ambrosi, A. Quarteroni and G. Rozza, Springer, Milan, Italy, 2011.
10. I.V. Pivkin*, B. Caswell and G.E. Karniadakis, "Dissipative Particle Dynamics", Chapter 2 in Reviews in Computational Chemistry, Vol. 27, edited by Kenny B. Lipkowitz, John Wiley Sons, Inc., 2011.
11. D.A. Fedosov*, B. Caswell and G.E., Karniadakis, "Dissipative particle dynamics modeling of red blood cells", in Computational Hydrodynamics of Capsules and Biological Cells, edited by C. Pozrikidis, CRC Press, Boca Raton, FL, 2010.
12. N. Aluru and G.E. Karniadakis, "Numerical simulation of microflows and nanoflows", Chapter 3 in Micro/Nano Technology Systems for Biomedical Applications, edited by C.-M. Ho, Oxford University Press, 2010.
13. X. Wan and G.E. Karniadakis, "Adaptive numerical solutions of stochastic differential equations", Computer Mathematics its Applications (1994-2005), pp. 561-573, 2006.
14. "Spectral Interpolation in Non-Orthogonal Domains: Algorithms and Applications", special issue of Journal of Engi- neering Mathematics, guest editor (co-editor: Jan Hesthaven).
15. "Uncertainty Quantification in Simulation Science", special issue of Journal of Computational Physics, vol. 217, no. 1, 2006, guest editor (co-editor: James Glimm).
16. V. Symeonidis*, G.E. Karniadakis and B. Caswell, "Simulation of -phage DNA in microchannels using dissipative particle dynamics, Bulletin of the Polish Academy of Sciences, vol. 53 (4), pp. 395-403, 2005.
17. D. Xiu* and G.E. Karniadakis, "Generalized polynomial chaos: Performance evaluation and applications", chapter in Dynamic Data Driven Applications Simulations (DDDAS), editor F. Darema, Kluwer, 2004.

18. R.M. Kirby* and G.E. Karniadakis, "Spectral Element and hp Methods", Encyclopedia of Computational Mechanics, John Wiley Sons Ltd, 2004.

19. G.E. Karniadakis and K.-S. Choi, "Mechanisms on transverse motions in turbulent wall flows", Annual Review of Fluid Mechanics, vol. 35, 45-62, 2003.

20. G.E. Karniadakis, "Quantifying Uncertainty in CFD", Managing Editor of special issue of J. Fluids Engineering, March 2002.

21. R.M. Kirby* and G.E. Karniadakis, "Under-Resolution and Diagnostics in Turbulent Simulations of Complex- Geometry Flows", Turbulent Flow Computations, Kluwer, 2002.

22. R.M. Kirby*, G.E. Karniadakis, O. Mikulchenko and K. Mayaram, "Integrated Simulation for MEMS: Coupling Flow- Structure-Thermal-Electrical Domains", Chapter 5, The MEMS Handbook, CRC Press.

23. "Spectral, Spectral Element and hp Methods for CFD", guest editor of C.M.A.M.E., (co-editors: M. Ainsworth and C. Bernardi), vol. 175.

24. "Discontinuous Galerkin Methods: Theory Computation and Applications", (editors: B. Cockburn, G.E. Karniadakis and C.-W. Shu), Springer-Verlag, February 2000.

25. G.E. Karniadakis and R.D. Henderson*, "Spectral Element Methods for Incompressible Flows", chapter 29 in Handbook of Fluid Dynamics, edited by R.W. Johnson, CRC Press, 1998.

26. G.E. Karniadakis, "Towards a numerical error bar in CFD," Editorial Article, J. Fluids Engineering, March 1995.

27. G.E. Karniadakis S.A. Orszag, "Nodes, Modes, and Flow Codes," Physics Today, p. 34-42, March 1993.

28. G.E. Karniadakis S.A. Orszag, "Some novel aspects of spectral methods," Algorithmic Trends in Computational Fluid Dynamics," eds. M.Y. Hussaini, A. Kumar, M.D. Salas, p. 245, Springer-Verlag, 1993.

29. G.E. Karniadakis, S.A. Orszag, E.M. Ronquist and A.T. Patera, "Spectral element and lattice gas methods for incompressible fluid dynamics," chapter 8 in Incompressible Fluid Dynamics, eds. M.D. Gunzburger and R.A. Nicolaides, Cambridge University Press, 1993.

30. R.D. Henderson* G.E. Karniadakis, "A hybrid spectral element-finite difference method for parallel computers,"p. 221, Unstructured Scientific Computation on Scalable Multi-Processors, ed. P. Mehrotra, J. Saltz, and R. Voigt, M.I.T. Press, 1992.

31. G.E. Karniadakis S.A. Orszag, "Parallel spectral computations of complex engineering flows," chapter 9 in Super-computing in Engineering Analysis, New Generation Computing, ed. H. Adeli, 1990.

B. Articles in Refereed Journals

Machine and Deep Learning

1. Lin C, Maxey M, Li Z, Karniadakis GE. A seamless multiscale operator neural network for inferring bubble dynamics. Journal of Fluid Mechanics. 2021 Dec;929.

2. Lou Q, Meng X, Karniadakis GE. Physics-informed neural networks for solving forward and inverse flow problems via the Boltzmann-BGK formulation. Journal of Computational Physics. 2021 Dec 15;447:110676.

3. Mao Z, Lu L, Marxen O, Zaki TA, Karniadakis GE. DeepMMnet for hypersonics: Predicting the coupled flow and finite-rate chemistry behind a normal shock using neural-network approximation of operators. Journal of Computational Physics. 2021 Dec 15;447:110698.

4. Jagtap AD, Shin Y, Kawaguchi K, Karniadakis GE. Deep Kronecker neural networks: A general framework for neural networks with adaptive activation functions. Neurocomputing. 2022 Jan 11;468:165-80.

5. E. Kharazmi, M. Cai, Z. Zhang, G. Lin, and G.E. Karniadakis, "Identifiability and predictability of integer- and fractional-order epidemiological models using physics-informed neural networks", Nat Comput Sci (2021). https://doi.org/10.1038/s43588-021-00158-0.

6. L. Lu, X. Meng, Z. Mao, and G. E. Karniadakis, "DeepXDE: A Deep Learning Library for Solving Differential Equations", SIAM Rev., 63(1), 208–228. (21 pages), DOI. 10.1137/19M1274067, February 2021.

7. G.E. Karniadakis, I.G. Kevrekidis, L. Lu, et al., "Physics-informed machine learning", Nature Review Physics 3, 422–440 (2021), https://doi.org/10.1038/s42254-021-00314-5

8. S. Cai, H. Li, F. Zheng, F. Kong, M. Dao, G.E. Karniadakis, Subra Suresh, " Artificial intelligence velocimetry and microaneurysm-on-a-chip for three-dimensional analysis of blood flow in physiology and disease", Proceedings of National Academy of Sciences, 118 (13) e2100697118; DOI: 10.1073/pnas.2100697118, Mar 2021.

9. L. Yang, X. Meng, G. E. Karniadakis, "B-PINNs: Bayesian physics-informed neural networks for forward and inverse PDE problems with noisy data", Journal of Computational Physics, Volume 425, 109913, January 2021.

10. X. Jin, S. Cai, H. Li, G. E. Karniadakis, "NSFnets (Navier-Stokes flow nets): Physics-informed neural networks for the incompressible Navier-Stokes equation", Journal of Computational Physics, Volume 426, 109951, February 2021.

11. E. Kharazmi, Z. Zhang, G.E. Karniadakis, "hp-VPINNs: Variational physics-informed neural networks with domain decomposition", Computer Methods in Applied Mechanics and Engineering, Volume 374, 113547, February 2021.

12. S. Cai, Z. Wang, F. Fuest, Y. Jeon, C. Gray, G. Karniadakis, "Flow over an espresso cup: Inferring 3-D velocity and pressure fields from tomographic background oriented Schlieren via physics-informed neural networks", Journal of Fluid Mechanics, 915, A102. doi:10.1017/jfm.2021.135, March 2021

13. S Cai, Z Wang, L Lu, TA Zaki, GE Karniadakis, DeepMMnet: Inferring the electroconvection multiphysics fields based on operator approximation by neural networks, Journal of Computational Physics, 110296, 2021.

14. S Cai, Z Wang, S Wang, P Perdikaris, G Karniadakis, Physics-Informed Neural Networks (PINNs) for Heat Transfer Problems, Journal of Heat Transfer, 2021.

15. . M Mahmoudabadbozchelou, M Caggioni, S Shahsavari, WH Hartt, S Jamali, GE Karniadakis, Data-driven physics-informed constitutive metamodeling of complex fluids: A multifidelity neural network (MFNN) framework, Journal of Rheology 65 (2), 179-198, 201.

16. L Lu, P Jin, G Pang, Z Zhang, GE Karniadakis, Learning nonlinear operators via DeepONet based on the universal approximation theorem of operators, Nature Machine Intelligence 3 (3), 218-229, 2021.

17. M Yin, X Zheng, JD Humphrey, GE Karniadakis, Non-invasive inference of thrombus material properties with physics-informed neural networks, Computer Methods in Applied Mechanics and Engineering 375, 113603, 2021.

18. L Zhao, Z Li, Z Wang, B Caswell, J Ouyang, GE Karniadakis, Active-and transfer-learning applied to microscale-macroscale coupling to simulate viscoelastic flows, Journal of Computational Physics 427, 110069, 2021.

19. J del Águila Ferrandis, MS Triantafyllou, C Chryssostomidis, GE, Karniadakis, Learning functionals via LSTM neural networks for predicting vessel dynamics in extreme sea states, Proceedings of the

Royal Society A 477 (2245), 20190897, 2021.

20. L Lu, X Meng, Z Mao, GE Karniadakis, DeepXDE: A deep learning library for solving differential equations, SIAM Review 63 (1), 208-228, 2021.

21. P Jin, Z Zhang, A Zhu, Y Tang, GE Karniadakis, SympNets: Intrinsic structure-preserving symplectic networks for identifying Hamiltonian systems, Neural Networks 132, 166-179, 2020.

22. A Yazdani, L Lu, M Raissi, GE Karniadakis, Systems biology informed deep learning for inferring parameters and hidden dynamics, PLoS computational biology 16 (11), e1007575, 2020.

23. AD Jagtap, GE Karniadakis, Extended Physics-Informed Neural Networks (XPINNs): A Generalized Space- Time Domain Decomposition Based Deep Learning Framework for Nonlinear Partial Differential Equations, Communications in Computational Physics 28 (5), 2002-2041, 2020.

24. D Fan, L Yang, Z Wang, MS Triantafyllou, GE Karniadakis, Reinforcement learning for bluff body active flow control in experiments and simulations, Proceedings of the National Academy of Sciences 117 (42), 26091- 26098, 202.

25. L. Yang and G.E. Karniadakis, Potential Flow Generator with L2 optimal transport regularity for generative models, IEEE Transactions on Neural Networks and Learning Systems, doi: 10.1109-TNNLS.2020.3028042, 2020.

26. L. Yang, X. Meng and G,.E. Karniadakis, B-PINNs: Bayesian physics-informed neural networks for forward and inverse PDE problems with noisy data, Journal of Computational Physics, 109913, 2021.

27. P. Jin, Z. Zhang, A. Zhu, Y. Tang, G.E. Karniadakis, SympNets: Intrinsic structure-preserving symplectic networks for identifying Hamiltonian systems, Neural Networks, 132, pp.166-179, 2020.

28. Q Zheng, L Zeng, GE Karniadakis, Physics-informed semantic inpainting: Application to geostatistical modeling, . Journal of Computational Physics, 419, 10967, 2020.

29. G. Pang, M. D'Elia, M. Parks, G. E. Karniadakis, nPINNs: Nonlocal physics-informed neural networks for a parametrized nonlocal universal Laplacian operator. Algorithms and applications, Journal of Computational Physics Volume 422, 109760, December 2020.

30. K. Shukla, P. C. Di Leoni, J. Blackshire, D. Sparkman, G. E. Karniadakis, Physics-Informed Neural Network for Ultrasound Nondestructive Quantification of Surface Breaking Cracks, Journal of Nondestructive Evaluation, Article number: 61, August 2020.

31. A. D. Jagtap, K. Kawaguchi, G. E. Karniadakis, Locally adaptive activation functions with slope recovery for deep and physics-informed neural networks, Proceedings of the Royal Socierty, https://doi.org/10.1098/rspa.2020.0334, July 2020.

32. X. Meng, Z. Li, D. Zhang, G. E. Karniadakis, PPINN: Parareal physics-informed neural network for time- dependent PDEs, Computer Methods in Applied Mechanics and Engineering, Volume 370, https://doi.org/10.1016/j.cma.2020.113250, October 2020

33. P.Jin, L. Lu, Y. Tanga, G. E. Karniadakis, Quantifying the generalization error in deep learning in terms of data distribution and neural network smoothness, Neural Networks, https://doi.org/10.1016/j.neunet.2020.06.024, July 2020.

34. Y. Chen, L. Lu, G. E. Karniadakis and L. D. Negro, Physics-informed neural networks for inverse problems in nano-optics and metamaterials, Optics Express, Vol. 28, Issue 8, pp. 11618-11633, https://doi.org/10.1364/OE.384875, 2020.

35. Q Zheng, L Zeng, GE Karniadakis, Physics-informed semantic inpainting: Application to geostatistical modeling, Journal of Computational Physics, 109676, 2020.

36. AD Jagtap, E Kharazmi, GE Karniadakis, Conservative physics-informed neural networks on discrete domains for conservation laws: Applications to forward and inverse problems ,Computer Methods in Applied Mechanics and Engineering 365, 113028, 2020.

37. L Lu, M Dao, P Kumar, U Ramamurty, GE Karniadakis, S Suresh, Extraction of mechanical properties of materials through deep learning from instrumented indentation, Proceedings of the National Academy of Sciences, March 16, 2020.

38. Z Mao, AD Jagtap, GE Karniadakis, Physics-informed neural networks for high-speed flows, Computer Methods in Applied Mechanics and Engineering 360, 112789, 2020.

39. AD Jagtap, K Kawaguchi, GE Karniadakis, Adaptive activation functions accelerate convergence in deep and physics-informed neural networks, Journal of Computational Physics 404, 109136, 2020.

40. M Raissi, A Yazdani, GE Karniadakis, Hidden fluid mechanics: Learning velocity and pressure fields from flow visualizations, Science 367 (6481), 1026-1030, 2020.

41. GCY Peng, M Alber, AB Tepole, WR Cannon, S De, .., GE Karniadakis, E. Kuhl, Multiscale Modeling Meets Machine Learning: What Can We Learn?, Archives of Computational Methods in Engineering, 1-2, 2020.

42. X Meng, GE Karniadakis, A composite neural network that learns from multi-fidelity data: Application to function approximation and inverse PDE problems, Journal of Computational Physics 401, 109020, 2020.

43. L Yang, D Zhang, GE Karniadakis, Physics-Informed Generative Adversarial Networks for Stochastic Differential Equations, SIAM Journal on Scientific Computing 42 (1), A292-A317, 2020.

44. D Zhang, L Guo, GE Karniadakis, Learning in modal space: Solving time-dependent stochastic PDEs using physics-informed neural networks, SIAM Journal on Scientific Computing 42 (2), A639-A665, 2020.

45. PP Mehta, G Pang, F Song, GE Karniadakis, Discovering a universal variable-order fractional model for turbulent Couette flow using a physics-informed neural network, Fractional Calculus and Applied Analysis 22 (6), 1675-1688, 2019.

46. Z Mao, Z Li, GE Karniadakis, Nonlocal flocking dynamics: Learning the fractional order of PDEs from particle simulations, Communications on Applied Mathematics and Computation 1 (4), 597-619, 2019.

47. D Fan, G Jodin, TR Consi, L Bonfiglio, Y Ma, LR Keyes, GE Karniadakis, ...,MS Triantafyllou, A robotic Intelligent Towing Tank for learning complex fluid-structure dynamics, Science Robotics 4 (36), 2019.

48. M Alber, AB Tepole, WR Cannon, S De, S Dura-Bernal, K Garikipati, ..., GE Karniadakis, E. Kuhl,, Integrating machine learning and multiscale modeling—perspectives, challenges, and opportunities in the biological, biomedical, and behavioral sciences, npj Digital Medicine 2 (1), 1-11, 2020.

49. D Zhang, L Lu, L Guo, GE Karniadakis, Quantifying total uncertainty in physics-informed neural networks for solving forward and inverse stochastic problems, Journal of Computational Physics, 2019.

50. G Pang, L Lu, GE Karniadakis, fPINNs: Fractional physics-informed neural networks, SIAM Journal on Scientific Computing 41 (4), A2603-A2626, 2019.

51. M Raissi, H Babaee, GE Karniadakis, Parametric Gaussian process regression for big data, Computational Mechanics 64 (2), 409-41, 2019.

52. M Gulian, M Raissi, P Perdikaris, G Karniadakis, Machine learning of space-fractional differential equations, SIAM Journal on Scientific Computing 41 (4), A2485-A2509, 2019.

53. AL Blumers, Z Li, GE Karniadakis, Supervised parallel-in-time algorithm for long-time Lagrangian simulations of stochastic dynamics: Application to hydrodynamics, Journal of Computational Physics 393, 214-228, 2019.

54. G Pang, L Yang, GE Karniadakis, Neural-net-induced Gaussian process regression for function approximation and PDE solution, Journal of Computational Physics 384, 270-288, 2019.

55. S Lee, F Dietrich, GE Karniadakis, IG Kevrekidis, Linking Gaussian process regression with data-driven manifold embeddings for nonlinear data fusion, Interface Focus 9 (3), 20180083, 2019.

56. M Raissi, Z Wang, MS Triantafyllou, GE Karniadakis, Deep learning of vortex-induced vibrations, Journal of Fluid Mechanics 861, 119-137, 2019.

57. L Bonfiglio, P Perdikaris, G Vernengo, JS de Medeiros, GE Karniadakis, Improving SWATH Seakeeping Performance using Multi-Fidelity Gaussian Process and Bayesian Optimization, Journal of Ship Research 62 (4), 223-240, 2018.

58. L Bonfiglio, P Perdikaris, J del Águila, GE Karniadakis, A probabilistic framework for multidisciplinary design: Application to the hydrostructural optimization of supercavitating hydrofoils, International Journal for Numerical Methods in Engineering 116 (4), 246-269, 2018.

59. D Zhang, L Yang, GE Karniadakis, Bi-directional coupling between a PDE-domain and an adjacent Data- domain equipped with multi-fidelity sensors, Journal of Computational Physics 374, 121-134, 2018.

60. M Raissi, Perdikaris P, Karniadakis GE. Physics-informed neural networks: A deep learning framework for solving forward and inverse problems involving nonlinear partial differential equations, Journal of Computational Physics 378, 686-707, 2019.

61. M Raissi, Karniadakis GE. Hidden physics models: Machine learning of nonlinear partial differential equations. Journal of Computational Physics. 2018 March 15; 357:125-41.

62. M. Raissi, P. Perdikaris, G.E. Karniadakis, "Inferring solutions of differential equations using noisy multi-fidelity data." J. Comp. Phys, vol. 335, 736-746, 2017, doi.org/10.1016/j.jcp.2017.01.060.

63. P. Perdikaris, D. Venturi and G. E. Karniadakis, "Multi-fidelity information fusion algorithms for high- dimensional systems and massive data sets", SIAM J. Sci. Comput., 38(4), B521-538, 2016.

64. P. Perdikaris and G. E. Karniadakis. "Model inversion via multi-fidelity Bayesian optimization: a new paradigm for parameter estimation in haemodynamics, and beyond," Journal of The Royal Society Interface, 13.118 (2016): 20151107.

65. P. Perdikaris, D. Venturi, J.O. Royset and G.E. Karniadakis, "Multi-fidelity modeling via recursive co-kriging and Gaussian Markov random fields," Proc. Roy. Soc. A 471, 20150018, DOI: 10.1098/rspa2015.0018, 2015.

66. L. Parussini, D. Venturi, P. Perdikaris, G.E. Karniadakis, "Multi-fidelity Gaussian process regression for prediction of random fields." J. Comput. Phys. 2017, 336, 36-50.

67. M. Raissi, P. Perdikaris, G. E. Karniadakis, "Numerical Gaussian Processes for Time-Dependent and Nonlinear Partial Differential Equations", SIAM J. Sci. Comput. 40(1), A172-A198, 2018.

68. L. Bonfiglio, P. Perdikaris, S. Brizzolara, G.E. Karniadakis, "Multi-fidelity optimization of supercavitating hydrofoils", Comput. Methods Appl. Mech. Engrg. 332, 63-85, 2018.

69. M. Raissi, P. Perdikaris, G.E. Karniadakis, Physics Informed Deep Learning (Part I): Data-driven Solutions of Nonlinear Partial Differential Equations, arXiv:1711.10561v1.

70. M. Raissi, P. Perdikaris, G.E. Karniadakis, Physics Informed Deep Learning (Part II): Data-driven Discovery of Nonlinear Partial Differential Equations, arXiv:1711.10566v1.

71. Y.H. Tang, D. Zhang, G.E. Karniadakis, "An Atomistic Fingerprint Algorithm for Learning Ab Initio Molecular Force Field", Sept 2017, arXiv:1709.09235v3, J. Chem. Phys. (COVER), 148, no. 3 (2018): 034101.

72. L. Zhao, Z. Li, B. Caswell, J. Ouyang, G.E. Karniadakis, "Active learning of constitutive relation from mesoscopic dynamics for macroscopic modeling of non-Newtonian flows", Sept 2017, arXiv:1709.06228v1, to appear in J. Comp. Phys., 363: 116-127, 2018.

73. . M. Xu, D.P. Papageorgiou, S.Z. Abidi, M. Dao, H. Zhao, and G.E. Karniadakis, A deep convolutional neural network for classification of red blood cells in sickle cell anemia, PLOS Computational Biology, 13(10): e1005746, 2017.

74. G. Pang, P. Perdikaris, W. Cai, G.E. Karniadakis, Discovering variable fractional orders of advection– dispersion equations from field data using multi-fidelity Bayesian optimization. Journal of Computational Physics. 2017 Nov 1;348:694-714.

75. P. Perdikaris, M. Raissi, A. Damianou, N. D. Lawrence, and G. E. Karniadakis, "Nonlinear information fusion algorithms for data-efficient multi-fidelity modeling." P. R. Soc. A. 473(2198), 2017.

76. M. Raissi, P. Perdikaris, G.E. Karniadakis, "Machine learning of linear differential equations using Gaussian processes." Journal of Computational Physics, 348, 683-693, 2017.

77. L. Bonfiglio, P. Perdikaris, S. Brizzolara, G.E. Karniadakis, "A multi-fidelity framework for investigating the performance of super-cavitating hydrofoils under uncertain flow conditions." In 19th AIAA Non-Deterministic Approaches Conference (p. 1328), 2017.

78. P. Prempraneerach, P. Perdikaris, G.E. Karniadakis, C. Chryssostomidis, "Sea Surface Temperature estimation from satellite observations and in-situ measurements using multifidelity Gaussian Process regression." In Digital Arts, Media and Technology (ICDAMT), International Conference on (pp. 28-33). IEEE, 2017

79. M. Raissi, P. Perdikaris, and G. E. Karniadakis, "Numerical Gaussian processes for time-dependent and non- linear partial differential equations." SIAM J. Sci. Comput. 40(1), A172-A198, 2018.

80. M. Raissi, G.E. Karniadakis, "Hidden Physics Models: Machine Learning of Nonlinear Partial Differential Equations." arXiv preprint arXiv:1708.00588, 2017.

81. H. Babaee, P. Perdikaris, C. Chryssostomidis, G.E. Karniadakis, Multi-fidelity modelling of mixed convection based on experimental correlations and numerical simulations. Journal of Fluid Mechanics. 2016 Dec;809:895-917.

82. S. Lee, I.G., Kevrekidis, G.E. Karniadakis, "A resilient and efficient CFD framework: Statistical learning tools for multi-fidelity and heterogeneous information fusion." Journal of Computational Physics, 344, 516-533, 2017.

83. S. Lee, I.G., Kevrekidis, G.E. Karniadakis "A general CFD framework for fault-resilient simulations based on multi-resolution information fusion". Journal of Computational Physics, 347, 290-304, 2017

84. S. Lee, I.G., Kevrekidis, G.E. Karniadakis, "Resilient algorithms for reconstructing and simulating gappy flow fields in CFD". Fluid Dynamics Research, 47(5), 051402, 2015.

85. A. Yakhot, T. Anor, G.E. Karniadakis, "A reconstruction method for gappy and noisy arterial flow data", IEEE transactions on medical imaging. 2007 Dec;26(12):1681-97.

86. H. Gunes, S. Sirisup, G.E. Karniadakis, "Gappy data: To Krig or not to Krig?", Journal of Computational Physics. 2006 Feb 10;212(1):358-82.

Fractional and Stochastic PDEs/Uncertainty Quantification

1. M Carlson, X Zheng, H Sundar, GE Karniadakis, RM Kirby, An open-source parallel code for computing the spectral fractional Laplacian on 3D complex geometry domains, Computer Physics Communications 261, 107695, 2021.
2. X Li, Z Mao, N Wang, F Song, H Wang, GE Karniadakis, A fast solver for spectral elements applied to fractional differential equations using hierarchical matrix approximation, Computer Methods in Applied Mechanics and Engineering 366, 113053, 2020
3. A. Lischke, G. Pang, M. Gulian, F. Song, C. Glusa, X. Zheng, Z. Mao, W. Cai, M. M. Meerschaert, M. Ainsworth, G. E. Karniadakis, "What is the fractional"", J. Comput. Phys., Vol. 404, pp. 109009, 2020.
4. H Zhang, X Jiang, F Zeng, GE Karniadakis, A stabilized semi-implicit Fourier spectral method for nonlinear space- fractional reaction-diffusion equations, Journal of Computational Physics 405, 10914, 2020.
5. L Guo, F Zeng, I Turner, K Burrage, GE Karniadakis, Efficient multistep methods for tempered fractional calculus: algorithms and simulations, SIAM Journal on Scientific Computing 41 (4), A2510-A2535, 2019.
6. N Wang, Z Mao, C Huang, GE Karniadakis, A spectral penalty method for two-sided fractional differential equations with general boundary conditions, SIAM Journal on Scientific Computing 41 (3), A1840-A1866, 2019.
7. T Zhao, Z Mao, GE Karniadakis, Multi-domain spectral collocation method for variable-order nonlinear fractional differential equations, Computer Methods in Applied Mechanics and Engineering 348, 377-395, 2019.
8. T Wang, F Song, H Wang, GE Karniadakis, Fractional Gray–Scott model: Well-posedness, discretization, and simulations, Computer Methods in Applied Mechanics and Engineering 347, 1030-1049, 2019.
9. F Song, GE Karniadakis, Fractional magneto-hydrodynamics: Algorithms and applications, Journal of Computational Physics 378, 44-62, 2019.
10. Z Zhang, W Deng, GE Karniadakis, A Riesz basis Galerkin method for the tempered fractional Laplacian, SIAM Journal on Numerical Analysis 56 (5), 3010-3039, 2018.
11. F Zeng, I Turner, K Burrage, GE Karniadakis, A new class of semi-implicit methods with linear complexity for nonlinear fractional differential equations, SIAM Journal on Scientific Computing 40 (5), A2986-A3011, 2018.
12. Z. Zhang, W. Deng, G.E. Karniadakis, "A Riesz basis Galerkin method for the tempered fractional Laplacian", https://arxiv.org/pdf/1709.10415.pdf, SIAM Journal on Numerical Analysis, to appear, 2018.
13. A. Lischke, M. Zayernouri, G. E. Karniadakis, "A Petrov-Galerkin spectral method of linear complexity for fractional multi-term ODEs on the half line", SIAM J. Sci. Comput., Vol. 39 (2017), No. 3, pp. A922-A946.
14. Z. Mao, G.E. Karniadakis, "A Spectral method (of exponential convergence) for singular solutions of the diffusion equation with general two-sided fractional derivative", SIAM Journal on Numerical Analysis, 56(1), 24-49, 2018.
15. F. Song, G.E. Karniadakis, "Fractional spectral vanishing viscosity method: Application to the quasi-geostrophic equation", Chaos, Solitons Fractals, 102, pp.327-332, 2017.
16. F. Zeng, Z. Mao, G.E. Karniadakis, "A generalized spectral collocation method with tunable accuracy for fractional differential equations with end-point singularities." SIAM J. Sci. Comput. 2017,

39(1);A360-A383.

17. F. Song, F. Zeng, W. Cai, W. Chen, G. E. Karniadakis, "Efficient two-dimensional simulations of the fractional Szabo equation with different time-stepping schemes." Computers and Mathematics with Applications, 2017, 73; 1286- 1297.

18. Z. Mao, G.E. Karniadakis, "Fractional Burgers equation with nonlinear non-locality: Spectral vanishing viscosity and local discontinuous Galerkin methods." J. Comput. Physics, 2017, 336; 143-163.

19. X. Chen, F. Zeng, G.E. Karniadakis, "A tunable finite difference method for fractional differential equations with non- smooth solutions." Comput. Methods Appl. Mech. Engrg. 2017, 318; 193-214.

20. C. Kim, O. Borodin and G.E. Karniadakis, "Quantification of sampling uncertainty for molecular dynamics simulation: Time-dependent diffusion coefficient in simple fluids", J. Comp. Phys., 302, 485-508, 2016.

21. W. Cao, Z. Zhang and G.E. Karniadakis, "Implicit-explicit difference schemes for nonlinear fractional differential equations with non-smooth solutions", SIAM J. Sci Comput., 38(5), A3070-A3093, 2016.

22. J. Suzuki, M. Zayernouri and G.E. Karniadakis, "Fractional-order uniaxial visco-elasto-plastic models for structural analysis", Computer Methods in Applied Mechanics and Engineering (2016), pp. 443-467, DOI information: 10.1016/j.cma.2016.05.030, 2016.

23. Y. Yu, P. Perdikaris and G.E. Karniadakis, Fractional Modeling of Viscoelasticity in 3D Cerebral Arteries and Aneurysms, J. Comput. Phys., 323, pp.219-242, 2016..

24. F. Song, C. Xu and G.E. Karniadakis, "A fractional phase-field model for two-phase flows with tunable sharpness: Algorithms and simulations," Computer Methods in Applied Mechanics and Engineering, 305, 376-404, 2016.

25. F. Zeng, Z. Zhang and G.E. Karniadakis, "Fast difference schemes for solving high-dimensional time-fractional subdiffusion equations, J. Comput. Phys. 307, 15-33, 2016.

26. F. Zeng, Z. Zhang and G.E. Karniadakis, "Second-order numerical methods for multi-term fractional differential equations: Smooth and non-smooth solutions", Computer Methods in Applied Mechanics and Engineering. 2017 Dec 1;327:478-502.

27. M. Zayernouri, M. Ainsworth and G.E. Karniadakis, "Tempered Fractional Sturm-Liouville eigenproblems," SIAM J. Sci. Comput.. 37(4) A1777-A1800, DOI: 10.1137/140985536, 2015.

28. H. Cho, Y. Yang, D. Venturi and G.E. Karniadakis, "Algorithms for propagating uncertainty across heterogeneous domains," SIAM J. Sci. Comput. 37(6), A3030-A3054, DOI: 10.1137/140992060, 2015.

29. Z. Zhang, B. Rozovskii, and G.E. Karniadakis, "Strong and weak convergence order of finite element methods for stochastic PDEs with spatial white noise", Numerische Mathematik, pp.1-29, (2015).

30. X. Zhao, Z.Z. Sun, and G.E. Karniadakis, "Second-order approximations for variable order fractional derivatives: Algorithms and applications", Journal of Computational Physics, 293, 184-200, (2015).

31. H. Cho, D. Venturi and G.E. Karniadakis, "Numerical methods for high-dimensional probability density function equations," J. Comput. Phys. 305, 817-837, 2016, DOI:10.1016/j.jcp.2015.10.030.

32. F. Zeng, Z. Zhang and G.E. Karniadakis, "A generalized spectral collocation method with turnable accuracy for variable-order fractional differential equations," SIAM J. Sci Comput. 37(6), A2710-A2732, DOI: 10.1137/141001299, 2015.

33. Z. Zhang, F. Zeng and G.E. Karniadakis "Optimal error estimates of spectral Petrov-Galerkin and collocation methods for initial value problems of fractional differential equations," SIAM J. Numer. Anal., 53(4) 2074-2096, 2015.

34. M. Zayernouri and G.E. Karniadakis, "Fractional spectral collocation methods for linear and nonlinear variable order FPDEs," J. Comput. Phys. 293, 312-338, DOI: 10.1016/j.jcp.1014.12.001, 2015.

35. W. Cao, Z. Zhang and G.E. Karniadakis "Time-splitting schemes for fractional differential equations I: Smooth solutions," SIAM J. Sci. Comput. 37(4), A1752-A1776, DOI: 10.1137/140996495, 2015.

36. Zheng M.* and G.E. Karniadakis. "Numerical methods for SPDEs with tempered stable processes", SIAM J. Sci. Comp., 37(3): A1197-A1217, DOI: 10.1137/140966083, 2015.

37. Zheng, M., Rozovsky, B., Karniadakis, G. E. "Adaptive Wick–Malliavin Approximation to Nonlinear SPDEs with Discrete Random Variables. SIAM Journal on Scientific Computing", 37(4), A1872-A1890, 2015.

38. W. Cao, Z. Zhang and G.E. Karniadakis, "Numerical methods for stochastic delay differential equations via the Wong-Zakai approximation," SIAM J. Sci. Comput, 37(1), A295-A318, 2015.

39. B. Yildirim and G.E. Karniadakis, "Stochastic simulations of ocean waves: An uncertainty quantification study," Ocean Modeling, 86, 15-35, 2015.

40. M. Zayernouri, M. Ainsworth and G.E. Karniadakis, "A unified Petrov-Galerkin spectral method for fractional PDEs," Computer Methods in Applied Mechanics and Engineering, 283, 1545-1569, DOI/10.1016/j.cma.2014.10.051, 2015.

41. Zheng M.*, X. Wan*, and GE Karniadakis. "Adaptive-multi-element polynomial chaos with discrete measure: Algo- rithms and application to SPDEs", Applied Numerical Mathematics, 90, 91-110, 2015.

42. H. Cho, D. Venturi and G.E. Karniadakis, "Statistical analysis and simulation of random shocks in Burgers turbulence," Proceedings of the Royal Society A, 470, 20140080, DOI: 10.1098/rspa.s014.0080, 2014.

43. Zhang, Z., X. Yang*, G. Marucci, P. Maffezzoni, I. Abe M. Elfadel, G.E. Karniadakis, and L. Daniel. "Stochastic testing simulator for integrated circuits and MEMS: Hierarchical and sparse techniques." In Custom Integrated Circuits Conference (CICC), 2014 IEEE Proceedings of the, pp. 1-8. IEEE, 2014.

44. Choi M.*, T. Sapsis, and G.E. Karniadakis, "On the equivalence of dynamically orthogonal and dynamically bi- orthogonal methods: Theory and numerical simulations", Journal of Computational Physics, 270, 1-20, 2014.

45. M. Zayernouri, W. Cao, Z. Zhang, G. E. Karniadakis, "Spectral and Discontinuous Spectral Element Methods for Fractional Delay Equations", SIAM J. Sci. Comput., 36 (6), B904B929, 2014.

46. Z. Zhang*, M.V. Tretyakov, B. Rozovskii and G.E. Karniadakis, "A recursive sparse grid collocation method for differential equations with white noise", SIAM J. Sci. Comput. 36(4), A1652-A1677, 2014.

47. M. Zayernouri* and G.E. Karniadakis, "Discontinuous spectral element methods for time-and space-fractional advection equations", SIAM J. Sci. Comput. 36(4), B684-B707, 2014.

48. D. Venturi and G.E. Karniadakis, "Convolutionless Nakajima-Zwanzig equations for stochastic analysis in nonlinear dynamical systems", Proc. R. Soc. A, 470, 20130754, 2014.

49. D. Venturi, X. Wan, R. Mikulevicius, B. Rozovskii and G.E. Karniadakis, "Wick-Malliavin approximation to nonlinear stochastic PDEs: Analysis and Simulation", Proc. R. Soc. A, 34:157-167, 2014.

50. M. Zayernouri* and G.E. Karniadakis, "Fractional spectral collocation methods", SIAM J. Sci. Comput. 36(1):A40- A62, 2014.

51. M. Zayernouri* and G.E. Karniadakis, "Exponentially accurate spectral and spectral element methods for fractional ODEs", J. Comput. Phys., 247:460-480, 214.

52. M. Choi*, T. Sapsis and G.E. Karniadakis, "A convergence study for SPDEs using combined polynomial chaos and dynamically-orthogonal schemes," J. Comp. Phys. 245, 281-301, 2013.

53. M. Zayernouri* and G.E. Karniadakis, "Fractional Sturm-Liouville eigen-problems: Theory and numerical approximation", J. Comp. Phys., 252, 495-517, 2013.

54. H. Cho, D. Venturi and G.E. Karniadakis, "Karhunen-Loeve expansion for multi-correlated processes", Probabilistic Engineering Mechanics, 34:157-167, 2013.

55. H. Cho, D. Venturi and G.E. Karniadakis, "Adaptive discontinuous Galerkin method for response-excitation PDF equations", SIAM J. Sci. Comput., vol. 35(4), pp. B890-B911, 2013.

56. M. Zayernouri, S-W. Park, D.M. Tartakovsky and G.E. Karniadakis, "Stochastic smoothed profile method for modeling random roughness in flow problems", Comput. Methods Appl. Mech. Engrg., vol. 263, pp. 99-112, 2013.

57. D. Venturi, D.M. Tartakovsky, A.M. Tartakovsky and G.E. Karniadakis, "Exact PDF equations and closure approxi- mations for advective-reactive transport", J. Comp. Phys., vol. 243, pp. 323-343, 2013.

58. X. Yang and G.E. Karniadakis, "Reweighted l1 minimization method for stochastic elliptic differential equations", J. Comp. Phys., vol.i 248, pp. 87-108, 2013.

59. Z. Zhang, X. Yang, G. Lin and G.E. Karniadakis, "Numerical solution of the Stratonovich-and Ito-Euler equations: Application to the stochastic piston problem", J. Comp. Phys., vol. 236, pp. 15-27, 2013.

60. Z. Zhang*, B. Rosvoskii, M.V. Tretyakov and G.E. Karniadakis, "A multi-stage Wiener chaos expansion method for stochastic advection-diffusion reaction equations", SIAM J. Sci. Comput., 34(2), A914-A936, 2012.

61. D. Venturi and G.E. Karniadakis, "New evolution equations for the joint response-excitation probability density function of stochastic solutions to first-order nonlinear PDEs", J. Comp. Phys., vol. 231, pp. 7450-7474, 2012.

62. D. Venturi, T. Sapsis, H. Cho and G.E. Karniadakis, " A computable evolution equation for the joint response- excitation probability density function of stochastic dynamical systems", Proc. Roy. Soc. A, vol. 468, pp. 759-783, 2012.

63. Z. Zhang*, M. Choi* and G.E. Karniadakis, "Error estimates for the ANOVA method with polynomial chaos interpo- lation: Tensor product functions", SIAM J. Sci. Comp., vol. 34(2), pp. A1165-A1186, 2012.

64. D. Venturi, M. Choi* and G.E. Karniadakis, "Supercritical quasi-continuum states in stochastic Rayleigh-Bernard convection", Int. J. Heat Mass Transfer, vol. 55, pp. 3732-3743, 2012.

65. X. Yang*, M. Choi* and G. Lin and G.E. Karniadakis, "Adaptive ANOVA decomposition of stochastic incompressible and compressible flows", J. Comp. Phys., vol. 231, pp. 1587-1614, 2012.

66. D. Venturi and G. E. Karniadakis, "Differential constraints for the probability density function of stochastic solutions to the wave equation", International Journal for Uncertainty Quantification, vol. 2(3), pp. 195-213, 2012.

67. M. Gerritsma, J-B. van der Steen, P. Vos and G.E. Karniadakis, "Time-dependent generalized polynomial chaos", J. Comput. Phys., 229:8333-8363, 2010.

68. P. Prempraneerach, F. Hover, M. Triantafyllou, and G.E. Karniadakis, "Uncertainty quantification in simulations of power systems: Multi-element polynomial chaos methods", Reliability Engineering and System Safety, vol. 95, pp. 632-646, 2010.

69. J. Foo* and G.E. Karniadakis, "Multi-element probabilistic collocation method in high dimensions", J. Comp. Phys., vol. 229(5), pp. 1536-1557, 2010.

70. D. Venturi, X. Wan and G.E. Karniadakis, "Stochastic bifurcation analysis of Rayleigh-Benard convection", J. Fluid Mech., vol. 650, pp. 391-413, 2010.

71. G. Lin* and G.E. Karniadakis, "Sensitivity analysis and stochastic simulations of non-equilibrium plasma flow", Int. J. Num. Meth. Engng., vol. 80, pp. 738-766, 2009.

72. X. Wan*, B. Rozovskii and G.E. Karniadakis, "A stochastic modeling methodology based on weighted Wiener chaos and Malliavin calculus", Proc. Nat. Acad. Sciences, vol. 106, no. 34, pp. 14189-14194, 2009.

73. G. Lin*, C.-H. Su and G.E. Karniadakis, "Stochastic modeling of random roughness in shock scattering problems: Theory and simulations", Computer Methods in Applied Mechanics and Engineering, vol. 197, pp. 3420-3434, 2008.

74. X. Wan* and G.E. Karniadakis, "Error control in multi-element generalized polynomial chaos method for elliptic problems with random coefficients", Communication in Computational Physics, vol. 5, pp. 793-820, 2009.

75. X. Wan* and G.E. Karniadakis, "Solving elliptic problems with non-Gaussian spatially-dependent random coefficients: algorithms, error analysis and applications", Comput. Methods Appl. Mech. Engr., vol. 198, pp. 1985- 1995, 2009. .

76. J. Foo*, X. Wan* and G.E. Karniadakis, "The multi-element probabilistic collocation method: error analysis and simulation", J. Comp. Phys., vol. 227, pp. 9572-9595, 2008.

77. D. Venturi, X. Wan and G.E. Karniadakis, "Stochastic low dimensional modeling of random laminar wake past a circular cylinder", Journal of Fluid Mechanics, vol. 606, pp. 339-367, 2008.

78. G. Lin, X. Wan, C.-H. Su and G.E. Karniadakis, "Stochastic fluid mechanics", IEEE Computing in Science and Engineering (CiSE), vol. 9, pp. 21-29, 2007.

79. G. Lin*, C.-H. Su and G.E. Karniadakis, "Random roughness enhances lift in supersonic flow", Phys. Rev. Let., vol 99, (10), 104501, 2007.

80. J. Foo*, Z. Yosibash and G.E. Karniadakis, "Stochastic simulation of riser-sections with uncertain measured pressure loads and/or uncertain material properties", Comput. Methods Appl. Mech. Engr., vol. 196, pp. 4250- 4271, 2007.

81. G. Lin*, C.-H. Su and G.E. Karniadakis, "Predicting shock dynamics in the presence of uncertainties, J. Comp. Phys., vol. 217, pp. 260-276, 2006.

82. X. Wan* and G.E. Karniadakis, "Stochastic heat transfer enhancement in a grooved channel", J. Fluid Mech., vol. 565, pp. 255-278, 2006.

83. X. Wan* and G.E. Karniadakis, "Beyond Wiener-Askey expansions: Handling arbitrary PDFs", Journal of Scientific Computing, vol. 27, pp. 455-464, 2006.

84. X. Wan* and G.E. Karniadakis, "Multi-element generalized polynomial chaos for arbitrary probability measures", SIAM Journal of Scientific Computing, vol. 28(3), pp. 901-928, 2006.

85. X. Wan* and G.E. Karniadakis, "Long-term behavior of polynomial chaos in stochastic flow simulations", Comput. Methods Appl. Mech. Engrg., vol. 195, pp. 5528-5596, 2006.

86. H. Gunes, S. Sirisup* and G.E. Karniadakis, "Gappy data: To Krig or not to Krig?", Journal of Computational Physics, vol. 212(1), pp. 358-382, 2006.

87. G. Lin*, L. Grinberg and G.E. Karniadakis, "Numerical studies of the stochastic Korteweg de Vries equation", Journal of Computational Physics, vol. 213(2), pp. 676-703, 2006.

88. X. Wan* and G.E. Karniadakis, "An adaptive multi-element generalized polynomial chaos method for stochastic differential equations", J. Comp. Phys., vol. 209(2), pp. 617-642, 2005.

89. X. Wan*, D. Xiu* and G.E. Karniadakis, "Stochastic solutions for the two-dimensional advection-diffusion equation", SIAM J. Sci. Comput., vol. 26(2), pp. 578-590, 2004.

90. D. Lucor* and G.E. Karniadakis, "Adaptive generalized polynomial chaos for nonlinear random oscillators", SIAM J. Sci. Comput., vol. 26(2), pp. 720-735, 2004.

91. D. Xiu* and G.E. Karniadakis, "Supersensitivity due to uncertain boundary conditions", Int. J. Num. Meth. Eng.', vol. 61, pp. 2114-2138, 2004.

92. G. Lin*, C.-H. Su and G.E. Karniadakis, "The stochastic piston problem", Proc. National Academy of Sciences, vol. 101, pp. 15840-15845, 2004.

93. D. Lucor* and G.E. Karniadakis, "Noisy inflows cause a shedding-mode switching in flow past an oscillating cylinder", Phys. Rev. Lett., vol. 92(15), 154501, 2004. (featured on the cover).

94. D. Venturi and G.E. Karniadakis, "Gappy data and reconstruction procedures for flow past cylinder", J. Fluid Mech., vol. 519, pp. 315-336, 2004.

95. D. Lucor*, C.-H. Su and G.E. Karniadakis, "Generalized polynomial chaos and random oscillators", Int. J. Num. Meth. Eng., vol. 60(3), pp. 571-596, 2004.

96. D. Lucor* and G.E. Karniadakis, "Predictability and uncertainty in flow-structure interactions", European Journal of Mechanics B/Fluids, vol. 23, pp. 41-49, 2004.

97. D. Lucor*, D. Xiu*, C.-H. Su and G.E. Karniadakis, "Predictability and uncertainty in CFD", Int. J. Num. Meth. Fluids, vol. 43(5), pp. 485-505, 2003.

98. D. Xiu* and G.E. Karniadakis, "Modeling uncertainty in flow simulations via generalized polynomial chaos", J. Comp. Phys., vol. 187, pp. 137-167, 2003.

99. D. Xiu* and G.E. Karniadakis, "A new stochastic approach to transient heat conduction modeling with uncertainty", Int. J. Heat Mass Transfer, vol. 46, pp. 4681-4693, 2003.

100. D. Xiu* and G.E. Karniadakis, "Modeling uncertainty in flow simulations via Generalized Polynomial Chaos", J. Comp. Phys., vol. 187, pp. 137-167, 2003.

101. D. Xiu* and G.E. Karniadakis, "The Wiener-Askey Polynomial Chaos for stochastic differential equations", SIAM Journal of Scientific Computing, vol 24, no. 2, pp. 619-644, 2002.

102. D. Xiu*, D. Lucor*, C.-H. Su and G.E. Karniadakis, "Stochastic modeling of flow-structure interactions using Generalized Polynomial Chaos", J. Fluids Engineering, vol. 124, pp. 51-59, 2002.

103. M. Jardak*, C.-H. Su and G.E. Karniadakis, "Spectral Polynomial Chaos solutions of the stochastic advection equation", J. Sci. Comp., vol. 17, pp. 319-338, 2002.

104. D. Xiu* and G.E. Karniadakis, "Modeling uncertainty in steady state diffusion problems via generalized polynomial chaos", Comput. Methods Appl. Mech. Engrg., vol. 191, pp. 4927-4948, 2002.

Spectral Element and Discontinuous Galerkin Methods

1. Z Wang, X Zheng, C Chryssostomidis, GE Karniadakis, A phase-field method for boiling heat transfer, Journal of Computational Physics, 110239, 2021.

2. Z Wang, S Dong, MS Triantafyllou, Y Constantinides, GE Karniadakis, "A stabilized phase-field method for two- phase flow at high Reynolds number and large density/viscosity ratio", Journal of Computational Physics 397, 108832, 2019.

3. Z Wang, MS Triantafyllou, Y Constantinides, GE Karniadakis, A spectral-element/Fourier smoothed profile method for large-eddy simulations of complex VIV problems, Computers Fluids 172, 84-96, 2019.

4. X. Zhen and G.E. Karniadakis, "A Phase-field/ALE method for simulating fluid-structure interactions in two-phase flow", Computer Methods in Applied Mechanics and Engineering, 309, 19-40, 2016.

5. X. Zheng, H. Babaee, S. Dong, C. Chryssotomidis, and G.E. Karniadakis, "A phase-field method for 3D simulation of two-phase heat transfer," Int. J. of Heat and Mass Transfer, 82, 282-298, DOI: 10.1016/j.jijheatmasstransfer.2014.11.052, 2015.

6. S. Dong, G.E. Karniadakis and C. Chryssostomidis, "A robust and accurate outflow boundary condition for incom- pressible flow simulations on severely-truncated unbounded domains", J. Comput. Phys., 261:83-105, 2014.

7. Y. Yue*, H. Baek* and G.E. Karniadakis, "Generalized fictitious methods for fluid-structure interactions: Analysis and simulations", J. Comp. Phys., vol. 245, 317-346, 2013.

8. H. Baek* and G.E. Karniadakis, "A convergence study of a new partitioned fluid-structure interaction algorithm based on fictitious mass and damping", J. Comp. Phys., vol. 231(2), 629-652, 2012.

9. B. Yildirim* and G.E. Karniadakis, "A hybrid spectral/DG method for solving the phase-averaged ocean wave equation: Algorithm and validation", J. Comp. Phys., vol. 231, pp. 4921-4953, 2012.

10. Y. Yue*, H. Baek*, M.L. Bittencourt and G.E. Karniadakis, "Mixed spectral/hp element formulation for nonlinear elasticity", Computer Methods in Applied Mechanics and Engineering, vol. 213-216, pp. 42-57, 2012.

11. H. Baek* and G.E. Karniadakis, "Sub-iteration leads to accuracy and stability enhancements of semi-implicit schemes for the Navier-Stokes equations", J. Comp. Phys., vol. 230, pp. 4384-4402, 2011.

12. X. Luo*, A. Beskok and G.E. Karniadakis, " Modeling electrokinetic flows by the smoothed profile method", J. Comp. Phys., vol. 229, pp. 3828-3847, 2010.

13. X. Luo*, M. Maxey and G.E. Karniadakis, "Smoothed Profile Method for Particulate Flows: Error Analysis and Simulations", J. Comp. Phys., vol. 228, pp. 1750-1769, 2009.

14. L. Grinberg* and G.E. Karniadakis, "Hierarchical spectral basis and Galerkin formulation using barycentric quadrature grids in triangular elements", Journal of Engineering Mathematics, 56(3), 289-306, 2007.

15. R.M. Kirby*, Z. Yosibash and G.E. Karniadakis, "Towards stable coupling methods for high-order discretization of fluid-structure interaction: Algorithms and observations", J. Comp. Phys., vol. 223, pp. 489-518, 2007.

16. X. Wan* and G.E. Karniadakis, "A sharp error estimate for the fast Gauss transform", J. Comp. Phys., vol. 219, pp. 7-12, 2006.

17. G. Lin* and G.E. Karniadakis, "A discontinuous Galerkin method for two-temperature plasmas", Comput. Methods Appl. Mech. Engrg., vol. 195, pp. 3504-3527, 2006.

18. R.M. Kirby* and G.E. Karniadakis, "Selecting the numerical flux in discontinuous Galerkin methods for diffusion problems", Journal of Scientific Computing, vols. 22-23 (1-3), pp. 385-411, 2005.

19. D. Xiu*, S.J. Sherwin, S. Dong and G.E. Karniadakis, "Strong and auxiliary forms of the semi-Lagrangian method for incompressible flows", Journal of Scientific Computing, vol. 25, pp 323-346, 2005.

20. S. Dong, D. Liu*, M.R. Maxey and G.E. Karanidakis, "Spectral distributed Lagrange multiplier method: Algorithm and benchmark tests", Journal of Computational Physics, vol. 195, pp. 695-717, 2004.

21. R.M. Kirby* and G.E. Karniadakis, "De-aliasing on non-uniform grids: algorithms and applications, J. Comp. Phys., vol. 191, pp. 249-264, 2003.

22. D. Liu*, M. Maxey and G.E. Karniadakis, "A fast method for particulate microflows", J. Microelectromechanical Systems, vol. 11(6), pp. 691-702, 2002.

23. R.M. Kirby* and G.E. Karniadakis, "Coarse resolution turbulence simulations using SVV-LES", J. Fluids Eng., vol. 177, p. 133, 2002.

24. J.Xu*, D. Xiu* and G.E. Karniadakis, "A Semi-Lagrangian method for turbulence simulations using mixed spectral discretizations", J. Sci. Comp., vol. 17, pp. 585-597, 2002.

25. C. Evangelinos*, D. Lucor*, C.-H. Su and G.E. Karniadakis, "Flow-induced vibrations of non-linear cables, Part I: Models and Algorithms", Int. J. Num. Meth. Engin., vol. 55, pp. 535-556, 2002.

26. R.M. Kirby*, G.E. Karniadakis, O. Mikulchenko and K. Mayaram, "An integrated simulator for coupled domain problems in MEMS", J. Microelectromechanical Systems, vol. 10(3), pp. 379-399, 2001.

27. D. Xiu* and G.E. Karniadakis, "A semi-Lagrangian high-order method for Navier-Stokes equations", J. Comp. Phys., vol. 172, pp. 658-684, 2001.

28. G.S. Karamanos and G.E. Karniadakis, "A spectral vanishing viscosity method for large-eddy simulations", J. Comp. Phys., vol. 162, pp. 22-50, 2000.

29. J. Trujillo* and G.E. Karniadakis, "A penalty method for the vorticity-velocity formulation", J. Comp. Phys., vol. 149, pp. 32-58, 1999.

30. R.M. Kirby*, T.C. Warburton*, I. Lomtev* and G.E. Karniadakis, "A discontinuous Galerkin spectral/hp method on hybrid grids", J. Appl. Num. Math., vol. 33, pp. 393-405, 1999.

31. I. Lomtev*, R.M. Kirby*, and G.E. Karniadakis, "A discontinuous Galerkin ALE method for compressible viscous flows in moving domains", J. Comp. Phys., vol. 155, pp. 128-159, 1999.

32. T.C. Warburton* and G.E. Karniadakis, "A discontinuous Galerkin method for the viscous MHD equations", J. Comp. Phys., vol. 152, pp. 608-641, 1999.

33. T.C. Warburton*, I. Lomtev*, Y. Du*, S.J. Sherwin*, and G.E. Karniadakis, "Galerkin and discontinuous Galerkin spectral/hp methods", Comp. Meth. Appl. Mech. Engr., vol. 175, pp. 343-359, 1999.

34. T.C. Warburton*, S.J. Sherwin* and G.E. Karniadakis, "Basis functions for triangular and quadrilateral high-order elements", SIAM J. Scientific Computing, vol. 20(5), pp. 1671-1695, 1999.

35. I. Lomtev*, and G.E. Karniadakis, "A discontinuous Galerkin method for the Navier-Stokes equations", Int. J. Num. Meth. Fluids, vol. 29, pp. 587-603, 1999.

36. I. Lomtev*, C.B. Quillen and G.E. Karniadakis, "Spectral/hp methods for viscous compressible flows on unstructured 2D meshes", J. Comp. Phys., vol. 144, pp. 325-357, 1998.

37. S.J. Sherwin*, T.C. Warburton*, and G.E. Karniadakis, "Spectral/hp methods for elliptic problems on hybrid grids", Contemporary Mathematics, vol. 218, p. 191-215, 1998.

38. S.J. Sherwin* and G.E. Karniadakis, "Tetrahedral hp finite elements: Algorithms and flow simulations," J. Comp. Phys., vol. 124, p. 14, 1996.

39. D. Pathria G.E. Karniadakis, "Spectral element methods for elliptic problems in non-smooth domains," J. Comp. Phys., vol. 122, p. 83, 1995.

40. S.J. Sherwin* and G.E. Karniadakis, "A triangular spectral element method; Applications to the incompressible Navier-Stokes equations," C.M.A.M.E., vol. 123, p. 189, 1995.

41. S.J. Sherwin* and G.E. Karniadakis, "A new triangular and tetrahedral basis for high-order finite element methods," Int. J. Num. Meth. Eng., vol. 38, p. 3775, 1995.

42. R.D. Henderson* and G.E. Karniadakis, "Unstructured spectral element methods for simulation of turbulent flows," J. Comp. Phys., vol. 122 p. 191, 1995.

43. J. Giannakouros* and G.E. Karniadakis, "A spectral element-FCT method for the compressible Euler equations," J. Comp. Phys., vol 115, p. 65, 1994.

44. J. Giannakouros*, D. Sidilkover G.E. Karniadakis, "Spectral element-FCT method for the one-and two- dimensional Euler equations," C.M.A.M.E., vol. 116, p. 113, 1994; also in ICOSAHOM, p. 113, (eds. C. Bernardi Y. Maday), North Holland, 1992.

45. D. Sidilkover G.E. Karniadakis, "Non-oscillatory spectral element Chebyshev method for shock wave calculations," Proc. 5th Conf. on Domain Decomposition Methods, SIAM, 1991, also in J. Comp. Phys., vol. 107, p. 10, 1993.

46. G.E. Karniadakis, M. Israeli S.A. Orszag, "High-order splitting methods for the incompressible Navier-Stokes equations," J. Comp. Phys., vol. 97, p.414, 1991.

47. R.D. Henderson* G.E. Karniadakis, "Hybrid spectral element-low order methods for incompressible flows," J. Sci. Comp., vol. 6, No. 2, p. 79, 1991.

48. J. Giannakouros* G.E. Karniadakis, "Spectral element-FCT method for scalar hyperbolic laws," Proc. 3rd Int. Conf. on Hyperb. Problems, vol. 1, p. 446, 1990 (also in Int. J. Num. Meth. Fluids, 14, p.707, 1992).

49. G.E. Karniadakis, "Spectral element-Fourier methods for incompressible turbulent flows," C.M.A.M.E., vol. 80, p. 362, 1990. (also in Proc. ICOSAHOM'89 Conf., Como, 1989).

50. A.G. Tomboulides*, M. Israeli G.E. Karniadakis, "Efficient removal of boundary-divergence errors in time- splitting methods," J. Sci. Comp., vol. 4, p. 291, 1989.

51. G.E. Karniadakis, "Spectral element simulations of laminar and turbulent flows in complex geometries," Appl. Num. Math., vol. 6, p. 85, 1989.

52. N.K. Ghaddar, G.E. Karniadakis A.T. Patera, "A conservative isoparametric spectral element method for forced convection: Application to fully developed flow in periodic geometries," Num. Heat Transfer, vol., 9, p.277, 1986.

Biomedical/Multiscale/Microfluidic Modeling

1. Li H, Liu ZL, Lu L, Buffet P, Karniadakis GE. How the spleen reshapes and retains young and old red blood cells: A computational investigation. PLoS computational biology. 2021 Nov 1;17(11):e1009516.

2. Liu ZL, Li H, Qiang Y, Buffet P, Dao M, Karniadakis GE. Computational modeling of biomechanics and biorheology of heated red blood cells. Biophysical Journal. 2021 Nov 2;120(21):4663-71.

3. A Yazdani, Y Deng, H Li, E Javadi, Z Li, S Jamali, C Lin, JD Humphrey, GE Karniadakis, Integrating blood cell mechanics, platelet adhesive dynamics and coagulation cascade for modelling thrombus formation in normal and diabetic blood, Journal of the Royal Society Interface 18 (175), 20200834, 2021.

4. Y., Deng, D.P. Papageorgiou, X. Li, N. Perakakis, C.S. Mantzoros, M. Dao and G.E. Karniadakis, Quantifying Fibrinogen-dependent Aggregation of Red Blood Cells in Type 2 Diabetes Mellitus. Biophysical Journal, vol. 119(5), ppp. 900902, 2020.

5. Y. Wang, Z. Li, J. Ouyang, G. E. Karniadakis, Controlled release of entrapped nanoparticles from thermoresponsive hydrogels with tunable network characteristics, Royal Society of Chemistry, DOI: 10.1039/D0SM00207K, April 2020.

6. K. Sampani, H. Li, X. Zheng, D. Papageorgiou, M. O. Bernabeu, W. Fickweiler, L. P. Aiello; G. Karniadakis, J. K. Sun, Computational fluid dynamics (CFD) estimation of thrombus formation in diabetic retinal microaneurysms (MAs), Investigative Ophthalmology Visual Science June 2020, Vol.61, 5023, Issue 7, June 2020.

7. X Zheng, A Yazdani, H Li, JD Humphrey, GE Karniadakis, A three-dimensional phase-field model for multiscale modeling of thrombus biomechanics in blood vessels, PLoS computational biology 16 (4), e1007709, 2020.

8. KS Kim, C Kim, GE Karniadakis, EK Lee, JJ Kozak, Density-dependent finite system-size effects in equilibrium molecular dynamics estimation of shear viscosity: Hydrodynamic and configurational study, The Journal of Chemical Physics, 151(10):104101, 2019.

9. L Lu, Z Li, H Li, X Li, PG Vekilov, GE Karniadakis, Quantitative prediction of erythrocyte sickling for the development of advanced sickle cell therapies, Science Advances 5 (8), eaax3905, 2019.

10. M Yin, A Yazdani, GE Karniadakis, One-dimensional modeling of fractional flow reserve in coronary artery disease: Uncertainty quantification and Bayesian optimization, Computer Methods in Applied Mechanics and Engineering 353, 66-85, 2019.

11. KS Kim, MH Han, C Kim, Z Li, GE Karniadakis, EK Lee, Nature of intrinsic uncertainties in equilibrium molecular dynamics estimation of shear viscosity for simple and complex fluids, The Journal of Chemical Physics 149 (4), 044510. 2019.

12. K Zhang, Z Li, M Maxey, S Chen, GE Karniadakis, Self-cleaning of hydrophobic rough surfaces by coalescence- induced wetting transition, Langmuir 35 (6), 2431-2442, 2019.

13. Y Deng, DP Papageorgiou, HY Chang, SZ Abidi, X Li, M Dao, GE Karniadakis, Quantifying shear-induced deformation and detachment of individual adherent sickle red blood cells, Biophysical journal 116 (2), 360-371, 2019.

14. Y Wang, Z Li, J Xu, C Yang, GE Karniadakis, Concurrent coupling of atomistic simulation and mesoscopic hydrodynamics for flows over soft multi-functional surfaces, Soft matter 15 (8), 1747-1757, 2019.

15. HY Chang, A Yazdani, X Li, KAA Douglas, CS Mantzoros, GE Karniadakis, Quantifying platelet margination in diabetic blood flow, Biophysical journal 115 (7), 1371-1382, 2018.

16. Y Yu, FF Bargos, H You, ML Parks, ML Bittencourt, GE Karniadakis, A partitioned coupling framework for peridynamics and classical theory: Analysis and simulations, Computer Methods in Applied Mechanics and Engineering 340, 905-931, 2018.

17. L Lu, Y Deng, X Li, H Li, GE Karniadakis, Understanding the Twisted Structure of Amyloid Fibrils via Molecular Simulations, The Journal of Physical Chemistry B 122 (49), 11302-11310, 2018.

18. D. P. Papageorgiou, S. Z. Abidi, H.-Y. Chang, X. J. Li, G. J. Kato, G. E. Karniadakis, M. Dao, and S. Suresh, "Simultaneous polymerization and adhesion under hypoxia in sickle cell anemia", Proc. Natl. Acad. Sci. U.S.A. 2018, 15 (38), 9473-9478. 2018.

19. H. Li, L. Lu, X. Li, P. Buffet, M. Dao, G. E. Karniadakis, and S. Suresh, "Mechanics of diseased red blood cells in human spleen and consequences for hereditary blood disorders", Proc. Natl. Acad. Sci. U.S.A., 115 (38), 9574- 9579, 2018.

20. H.-Y. Chang, X. Li, and G. E. Karniadakis*, "Modeling of biomechanics and biorheology of red blood cells in type-2 diabetes mellitus", Biophys. J. 2017, 113, 481-490. (BJ Highlighted Article)

21. X. Li, E. Du, M. Dao, S. Suresh, and G. E. Karniadakis, "Patient-specific modeling of individual sickle cell behavior under transient hypoxia", PLOS Comput. Biol. 2017, 13, e1005426. (Highlighted on Biophysical Society Blog).

22. X. Li, M. Dao, G. Lykotrafitis, and G. E. Karniadakis, "Biomechanics and biorheology of red blood cells in sickle cell anemia", J. Biomech. 2017, 50, 34-41. (Quarterly Most-downloaded Articles, as of June 2017)

23. X. Li, H. Li, H.-Y. Chang, G. Lykotrafitis, and G. E. Karniadakis, "Computational biomechanics of human red blood cells in hematological disorders", J. Biomech. Eng. 2017, 139, 020804.

24. Y. Yoshimoto, Z. Li, L. Kinefuchi and G.E. Karniadakis. Construction of non-Markovian coarse-grained models employing the Mori-Zwanzig formalism and iterative Boltzmann inversion. The Journal of Chemical Physics, 2017, 147: 244110. (Selected as Editor's Pick featured article).

25. L. Lu, H Li, X. Bian, X. Li, G.E. Karniadakis, "Mesoscopic adaptive resolution scheme: toward understanding of interactions between sickle cell fibers. Biophysical Journal (COVER). 2017 Jul 11;113(1):48-59.

26. A. Yazdani, H. Li, M.R. Bersi, P. DiAchille, J. Insley, J.D. Humphrey, G.E. Karniadakis, "Data-driven Modeling of Hemodynamics and its Role on Thrombus Size and Shape in Aortic Dissections." Scientific Reports, 2018, 8:2515.

27. Z. Li, X. Bian, Y.H., Tang, G. E. Karniadakis, "A dissipative particle dynamics method for arbitrarily complex geometries." J. Comp. Phys., 2018, 355: 534-547.

28. Y. Tang, L. Lu, H. Li, C. Evangelinos, L. Grinberg, V. Sachdeva, G. E. Karniadakis, "OpenRBC: A Fast Simulator of Red Blood Cells at Protein Resolution." Biophysical Journal, 2017, 112:2030-2037.

29. A.L. Blumers, Y.H. Tang, Z. Li, X. Li, G.E. Karniadakis, "GPU-accelerated red blood cells simulations with transport dissipative particle dynamics", Computer Physics Communications, 2017, 217, pp.171-179., 2017.

30. M. Deng, W. Pan, G.E. Karniadakis, "Anisotropic single-particle dissipative particle dynamics model." J. Comp. Phys. 2017, 336; 481-491.

31. A. Yazdani, H. Li, J. D. Humphrey, G. E. Karniadakis, "A General Shear-Dependent Model for Thrombus Formation.", PLoS Comput Biol. 13(1): e1005291, 2017. doi:10.1371/journal.pcbi.1005291.

32. Z. Li, H.S. Lee, E. Darve, G.E. Karniadakis, "Computing the non-Markovian coarse-grained interactions derived from the Mori-Zwanzig formalism in molecular systems: Application to polymer melts." J. Chem. Phys. 2017, 146, DOI:10.1063/1.4973347

33. X. Li, G.E. Karniadakis, "Biomechanics and biorheology of red blood cells in sickle cell anemia." J. Biomechanics, 50: 34-41, 2017.

34. H. Chang, X. Li, H. Li, G.E. Karniadakis, "MD/DPD Multiscale Framework for Predicting Morphology and Stresses of Red Blood Cells in Health and Disease," PLOS Computational Biology, 2016, 12(10), e1005173, 2016.

35. H. Lei, G.E. Karniadakis, "Systematic parameter inference in stochastic mesoscopic modeling," J. Comp. Phys., 330: 571-593, 2017.

36. M.K. Rausch, G.E. Karniadakis, J.D. Humphrey, "Modeling Soft Tissue Damage and Failure Using a Combined Particle/Continuum Approach", Biomech Model Mechanobiol, 2016. DOI10.1007/s10237-016-0814-1.

37. C. Kim and G.E. Karniadakis, "Brownian Motion of a Rayleigh Particle Confined in a Channel: A Generalized Langevin Equation Approach", Journal of Statisical Physics, 158, 1100-1125, 2015.

38. X. Bian, M. Deng, Y.H. Tang and G.E. Karniadakis, "Analysis of hydrodynamic fluctuations in heterogeneous adjacent multidomains in shear flow", Physical Review E, 93(3), 033312, 2016.

39. X. Bian, C. Kim and G.E. Karniadakis, "111 years of Brownian motion", Soft Matter, to appear, 2016.

40. X. Bian, Z. Li and G.E. Karniadakis, "Multi-resolution flow simulations by smoothed particle hydrodynamics via domain decomposition," J. Comput. Phys., 297, 131-155, DOI:10.11016/jjcp.2015.04.044, 2015.

41. P. Perdikaris, L. Grinberg and G.E. Karniadakis, "Multiscale modeling and simulation of brain blood flow," Phys. of Fluids, 28, 021304, DOI: 10/1063/1.4941315, 2016.

42. A. Yazdani, M. Deng, B. Caswell and G.E. Karniadakis, Flow in complex domains simulated by Dissipative Particle Dynamics driven by geometry-specific body-forces, 305, 906-920, doi:10.1016/j.jcp.2015.11.001, 2016.

43. A. Witthoft, A. Yazdani, Z. Peng, C. Bellini, J.D. Humphrey and G.E. Karniadakis, "A discrete particle model of a multilayerd fiber-reinforced arterial wall," J. Roy. Soc. Interface, 13, 20150964, DOI: 10.1098/rsif.2015.0964, 2016.

44. A. Yazdani and G.E. Karniadakis, "Sub-cellular modeling of platelet transport in blood flow through microchannels with constriction," Soft Matter, 12, 4339, DOI:10.1039/c6bsm00154h, 2016.

45. X.J. Li, E. Du, H. Lei, Y.-H. Tang, M. Dao, S. Suresh and G.E. Karniadakis, "Patient-specific modeling and predicting blood viscosity in sickle -cell anemia, Interface Focus, 6, 20150065, DOI: 10.1098/rsfs.2015.0065m 2016

46. Y.-H. Tang, Z. Li, X.J. Li, M.G. Deng and G.E. Karniadakis, "Non-equilibrium dynamics of vesicles and micelles by self-assembly of block copolymers with double thermoresponsivity," Macromolecules, 59, 2895-2903, DOI: 10.1021/acs.macromol.6600365, 2016.

47. A. Yazdani, X.J. Li and G.E. Karniadakis, "Dynamic and rheological properties of soft biological cell suspensions," Rheol Acta, 55(6), 433-449, DOI 10.1007/s00397-015-0869-4, 2016.

48. L. Lu, X.J. Li, P.G. Vekilov and G.E. Karniadakis, "Probing the twisted structure of sickle hemoglobin fibers via particle simulations, Biophys. J., 110, 2085-2093, doi:10.1016/j.bpj.2016.04.002, 2016.

49. X. Bian, Z. Li, M. Deng and G.E. Karniadakis, "Fluctuating hydrodynamics in periodic domains and heterogeneous adjacent multidomains: Thermal equilibrium", Physical Review E, 92 (5), 053302, 2015.

50. Z. Li, A. Yazdani, A. Tartakovsky and G.E. Karniadakis, "Transport dissipative particle dynamics model for mesoscopic advection-diffusion-reaction problems," J. Chem. Phys., 143, 014101, DOI: 10.1063/1.4923254, 2015.

51. P. Perdikaris, L. Grinberg and G.E. Karniadakis, "An effective fractal-tree closure model for simulating blood flow in large arterial networks, Annals. Biomed. Engin., 43(6), 1432-1442, DOI: 10.1007/s10439-014-1221-3, 2015.

52. Z. Li, X. Bian, X. Li and G.E. Karniadakis, "Incorporation of memory effects in coarse-grained modeling via the Mori-Zwanzig formalism,"J. Chem. Phys. 143, 243128, DOI: 10.1063/1.4935490, 2015.

53. Z. Li, Y-H. Tang, X. Li and G.E. Karniadakis, "Mesoscale modeling of phase transition dynamics of thermoresponisve polymers," Chem. Commun. 51, 11038-11040, DOI: 10.1039/c5cc01684c, 2015.

54. M. Deng and G.E. Karniadakis, Electrostatic correlations near charged planar surfaces," J. Chem. Phys. 141, 094703, DOI: 10.1063/1.3894053, 2014.

55. Z. Li, X. Bian, B. Caswell and G.E. Karniadakis, "Construction of dissipative particle dynamics models for complex fluids via the Mori-Zwannzig formulation" Soft Matter, DOI: 10.1039/C4SM01387E, 2014.

56. Z. Li, Y-H. Tang, H. Lei, B. Caswell and G.E. Karniadakis, "Energy-conserving dissipative particle dynamics with temperature-dependent properties," J. Comput. Phys., 265, 113-127, 2014.

57. K. Lykov, X. Li, H. Lei, I.V. Pivkin and G.E. Karniadakis " Inflow/outflow boundary conditions for particle-based blood flow simulations: Application to arterial bifurcations and trees," PLOS Computational Biology, 11 e1994419, DOI:10.1371/journal.pcbi.1004410, August 28, 2015.

58. M. Deng, L. Grinberg, B. Caswell and G.E. Karniadakis, "Effects of thermal noise on the transitional dynamics of an inextensible elastic filament in stagnation flow," Soft Matter, 11, 4962-4972, DOI: 10.1039/C4SM02395A, 2015.

59. X. Li, Z. Peng, H.Lei, M. Dao and G.E. Karniadakis, "Probing red blood cell mechanics, rheology and dynamics with a two-component multiscale model, Ph. Trans. R. Soc. A, 372, 20130389, DOI: 10.198/rsta.2013.0389, 2014.

60. D.A. Fedosov*, M. Dao, G.E. Karniadakis and S.Suresh, "Computational biorheology of human blood flow in health and disease," Annals of Biomedical Engineering, 42(2), 368-387, February 2014.

61. M. Deng* and GE Karniadakis. "Electrostatic correlations near charged planar surfaces", The Journal of Chemical Physics 141(9):094703. DOI: 10.1063/1.4894053, 2014.

62. Z. Li, X. Bian, B. Caswell, and GE Karniadakis. "Construction of dissipative particle dynamics models for complex fluids via the Mori-Zwanzig formulation", Soft Matter, 10 (43), 8659-8672. DOI: 10.1039/C4SM01387E, 2014.

63. C. Kim* and GE Karniadakis. "Brownian motion of a Rayleigh particle confined in a channel: A generalized Langevin equation approach", Journal of Statistical Physics, 10.1007/s10955-014-1160-2, 2014.

64. X. Li, Y.-H. Tang*, H. J. Liang, and G.E. Karniadakis, "Large-scale dissipative particle dynamics simulations of self-assembled amphiphilic systems", Chem. Commun. 2014, 50, 8306-8308.

65. C. Kim* and G.E. Karniadakis, "Time correlation functions of Brownian motion and evaluation of friction coefficient in the near-Brownian-limit regime", Multiscale Model. Simul., vol. 12, 225-248, 2014.

66. X. Li, Z. Peng, H. Lei*, M. Dao and G.E. Karniadakis, "Probing red cell mechanics, rheology and dynamics with a two-component multiscale model", Phil. Trans. Royal Society A, 372, 20130389, 2014.

67. M. Deng* and G.E. Karniadakis,"Coarse-grained modeling of protein unfolding dynamics", Multiscale Model. Simul., vol. 12, pp. 109-118, 2014.

68. P. Perdikaris* and G.E. Karniadakis, "Fractional-order viscoelasticity in one-dimensional blood flow models", Annals of Biomedical Engineering, vol. 42(5), pp. 1012-1023, 2014.

69. D. Fedosov*, M. Dao, G.E. Karniadakis and S. Suresh, "Computational biorheology of human blood flow in health and disease", Annals of Biomedical Engineering, 42:368-387, 2014.

70. Z. Li, Y. Tang*, H. Lei*, B. Caswell and G.E. Karniadakis, "Energy-conserving dissipative particle dynamics with temperature-dependent properties", J. Comp. Phys., 265:113-127, 2014.

71. A. Witthoft*, J.A. Filosa and G.E. Karniadakis, "Potassium buffering in the neurovascular unit: Models and sensitivity analysis," Biophysical Journal, 105, 2046-2054, 2013.

72. Z. Peng, X. Li, I. Pivkin, M. Dao, G.E. Karniadakis, and S. Suresh "Lipid bi-layer and cytoskeletal interactions in a red blood cell", Proc. Nat. Acad. Sciences, 110(33):13356-61, 2013.

73. X. Li, P. Vlahovska and G.E. Karniadakis, Continuum-and particle-based modeling of shapes and dynamics of red cells in health and disease", Soft Matter, 9:28-37, 2013.

74. H. Lei*, B. Caswell and G.E. Karniadakis, "Blood flow in small tubes: Quantifying the transition to the non- Newtonian regime", J. Fluid Mechanics, 722:214-239, 2013.

75. H. Lei* and G.E. Karniadakis, "Probing vaso-occlusion phenomena in sickle cell anemia via mesoscopic simulations", Proc. Nat. Acad. Sciences, 110(28):11326-30, 2013.

76. L. Grinberg, D.A. Fedosov and G.E. Karniadakis, "Parallel multiscale simulations of a brain aneurysm", J. Comp. Phys., 244, 131-147, 2013.

77. H. Lei* and G.E. Karniadakis, "Probing vaso-occlusion phenomena in sickle cell anemia via mesoscopic simulations", Proc. Nat. Acad. Sciences, 110(28):11326-30, 2013.

78. C. Kim* and G.E. Karniadakis, "Microscopic theory of Brownian motion revisited: The Rayleigh model", Phys. Rev. E, vol. 87, 032129, 2013.

79. M. Deng*, X. Li, H. Liang, B. Caswell and G.E. Karniadakis, "Simulation and modeling of slip flow over surface grafted with polymer brushes and glycocalyx fibers", J. Fluid Mech., vol. 711, 192-211, 2012.

80. X. Li, B. Caswell and G.E. Karniadakis, "Effect of chain chirality on the self-assembly of sickle hemoglobin", Biophys. J., vol. 103, pp. 1130-1140, 2012.

81. D.A. Steinman et al., "Variability of Computational Fluid Dynamics Solutions for pressure and flow in a giant aneurysm: The ASME 2012 Summer Bioengineering Conference CFD Challenge", J. Biomechanical Engineering, 135(2):0210161:13

82. X. Li, A. Popel and G.E. Karniadakis, "Blood-plasma separation in Y-shaped bifurcating microfluidic channels: A dissipative particle dynamics simulation study", Physical Biology, vol. 9, p. 026010, 2012.

83. H. Lei* and G.E. Karniadakis, "Predicting the morphology of sickle red blood cells using coarse-grained models of intracellular aligned hemologobin polymers", Soft Matter, vol. 8, p. 4507-4516, 2012.

84. H. Lei* and G.E. Karniadakis, "Quantifying the rheological and hemodynamic characteristics of sickle cell anemia", Biophysical Journal, vol. 102, pp. 185-194, 2012.

85. D. Fedosov*, B. Caswell, G. Karniadakis, "Wall shear stress-based method for adhesive dynamics of red blood cells in malaria", Biophysical Journal, vol. 100, pp. 2084-2093, 2011.

86. D. Fedosov*, H. Lei*, B. Caswell, S. Suresh and G.E. Karniadakis, "Multiscale modeling of red blood cell mechanics and blood flow in malaria", PLoS Computational Biology, vol. 7 (12), pp. 1-13, 2011.

87. D. Fedosov*, W. Pan*, B. Caswell, G. Gompper and G.E. Karniadakis, "Predicting human blood viscosity in silico", Proc. Nat. Acad. Sciences, vol. 108, pp. 11772-11777, 2011.

88. W. Pan*, D. Fedosov*, B. Caswell, and G.E. Karniadakis, "Predicting dynamics and rheology of blood flow: A comparative study of multiscale and low-dimensional models of red blood cells", Microvascular Research, vol. 82, pp. 163-170, 2011.

89. H. Lei*, D. Fedosov* and G.E. Karniadakis, "Time-dependent and outflow boundary conditions for Dissipative Particle Dynamics", J. Comp. Phys., vol. 230, pp. 3765-3779, 2011.

90. M. Arienti, W. Pan*, X. Li, and G.E. Karniadakis, "Many-body dissipative particle dynamics simulation of liquid/vapor and liquid/solid interactions", J. Chem. Phys., vol. 134, p. 204114, 2011.

91. D. Fedosov*, B. Caswell, S. Suresh and G.E. Karniadakis, "Quantifying the biophysical characteristics of Plasmododiumfalciparum-parasitized red blood cells in microcirculation, Proc. Nat. Acad. Sciences, vol. 108, pp. 35-39, 2011.

92. D. Quinn, I. Pivkin, S.Y. Yong, K.-H. Chiam, M. Dao, G.E. Karniadakis and S. Suresh, "Combined simulation and experimental study of large deformation of red blood cells in microfluidic systems", Annals of Biomedical Engineering, vol. 39(3), pp. 1041-1050, 2011.

93. T. Anor, L. Grinberg*, H. Baek, M. Jayraman, J.R. Madsen and G.E. Karniadakis, "Modeling of blood flow in arterial trees", Wiley Interdisciplinary Reviews: Systems Biology and Medicine, vol. 2, pp. 612-623, 2010.

94. L. Grinberg*, E. Cheever*, T. Anor, J.R. Madsen and G.E. Karniadakis, "Modeling blood flow circulation in intracranial arterial networks: A comparative 3D/1D simulation study", Annals of Biomedical Engineering, vol. 39, pp. 297-309, 2010.

95. H. Baek*, M.V. Jayaraman, P.D. Richardson and G.E. Karniadakis, "Flow instability and wall shear stress variation in intracranial aneurysms", J. of the Royal Society Interface, vol. 7, pp. 967-988, 2010.

96. D. Fedosov*, B. Caswell, A. Popel and G.E. Karniadakis, "Blood flow and cell-free layer in microvessels", Microcirculation, vol. 17 (8), pp. 615-628, 2010.

97. L. Grinberg* and G.E. Karniadakis, "Extrapolation-based acceleration of iterative solvers: Application to simulation of 3D flows", Commun. Comput. Phys., vol. 9, pp. 607-626, 2011.

98. W. Pan*, B. Caswell and G.E. Karniadakis, "A low-dimensional model for the red blood cell", Soft Matter, vol. 6, pp. 4366-4376, 2010.

99. . D. Fedosov*, B. Caswell and G.E. Karniadakis, "Systematic coarse-graining of spectrin-level red blood cell models, Computer Methods in Applied Mechanics and Engineering, vol. 199, pp. 1937-1948, 2010.

100. D. Fedosov*, B. Caswell and G.E. Karniadakis, "A multiscale red blood cell model with accurate mechanics, rheology and dynamics, Biophysical Journal, vol. 98, pp. 1-11, 2010.

101. H. Lei*, B. Caswell and G.E. Karniadakis, "Direct construction of mesoscopic models from microscopic simulations", Phys. Rev. E, vol. 81(2), 026704, 2010.

102. W. Pan*, B. Caswell and G.E. Karniadakis, "Rheology, Microstructure and Migration in Brownian Colloidal Suspensions", Langmuir, vol. 26(1), pp. 133-142, 2010.

103. H. Baek*, M.V. Jayaraman and G.E. Karniadakis, "Wall shear stress and pressure distribution on aneurysms and infundibulae in the posterior communicating artery bifurcation", Annals of Biomedical Engineering, Vol. 37, No. 12, pp. 2469-2487, 2009.

104. I. Pivkin*, P. Richardson and G.E. Karniadakis, "Effect of red blood cells on platelet aggregation", IEEE Engineering in Medicine Biology Magazine, vol. 28(2), 32-37, March-April 2009.

105. L. Grinberg*, A. Yakhot and G.E. Karniadakis, "Analyzing transient turbulence in a stenosed artery by Proper Orthogonal Decomposition", Annals of Biomedical Engineering, vol. 37(1), pp. 2200-2217, 2009.

106. X. Li, I. Pivkin*, H. Liang and G.E. Karniadakis, "Shape transformations of membrane vesicles from amphiphilic triblock copolymers: A Dissipative Particle Dynamics simulation study", Macromolecules, vol. 42, pp. 3195-3200, 2009.

107. J. Foo*, S. Sindi and G.E. Karniadakis, "Multi-element probabilistic collocation for sensitivity analysis in cellular signaling networks", IET Systems Biology, vol. 3 (4), pp. 239-254, 2009.

108. D. Fedosov* and G.E. Karniadakis, "Triple-Decker: Interfacing atomistic-mesoscopic-continuum flow regimes", J. Comp. Phys., vol. 228, pp. 1157-1171, 2009.

109. L. Grinberg*, T. Anor, E. Cheeve, J. R. Madsen and G. E. Karniadakis, "Simulation of the Human Intracranial Arterial Tree, Philosophical Transactions of the Royal Society A", vol. 367, pp. 2371-2386, 2009.

110. W. Pan*, D.A. Fedosov*, B. Caswell and G.E. Karniadakis, "Hydrodynamic interactions for single dissipative- particledynamics particles and their clusters and filaments," Phys. Rev. E, vol. 78, 046706, 2008.

111. W. Pan*, I.V. Pivkin* and G.E. Karniadakis, "Single-particle hydrodynamics in DPD: A new formulation," EuroPhysics Letters, vol. 84, 10012, 2008.

112. L. Grinberg* and G.E. Karniadakis, "Outflow boundary conditions for arterial networks with multiple outlets", Annals of Biomedical Engineering, vol. 36 (9), pp. 1496-1514, 2008.

113. L. Grinberg*, T. Anor, J.R. Madsen, A. Yakhot and G.E. Karniadakis, "Large-Scale Simulation of the Human Arterial Tree", Clinical and Experimental Pharmacology and Physiology, published on-line July 2008.

114. I. Pivkin* and G.E. Karniadakis, "Accurate coarse-grained modeling of red blood cells", Phys. Rev. Let., vol. 101(11), 118105, 2008.

115. D. Fedosov*, G.E. Karniadakis and B. Caswell, "Dissipative particle dynamics simulation of depletion layer and polymer migration in micro-and nanochannels for dilute polymer solutions", J. Chem. Phys., vol. 128, pp. 144903-14, 2008.

116. D. Fedosov*, I. Pivkin* and G.E. Karniadakis, "Velocity limit in DPD simulations of wall-bounded flows", J. Comp. Phys., vol. 227, pp. 2540-2559, 2008.

117. A. Yakhot, T. Amor and G.E. Karniadakis, "A reconstruction method for gappy and noisy arterial flow data", IEEE Transactions on Medical Imaging, vol. 26, No. 12, pp. 1681-1697, 2007.

118. I. Pivkin*, P.D. Richardson and G.E. Karniadakis, "Blood flow velocity effects and role of activation delay time on growth and form of platelet thrombi", Proc. Nat. Acad. Sci., USA, vol. 103, no. 46, 17164, 2006.

119. P.D. Richardson, I. Pivkin*, G.E. Karniadakis, and D.H. Laidlaw "Blood flow at arterial branches: Complexities to resolve at the angioplasty suite", Lecture Notes in Computer Science, vol. 3993, pp. 538-545, 2006.

120. V. Symeonidis*, G.E. Karniadakis and B. Caswell, "Schmidt number effects in dissipative particle dynamics simulation of polymers", J. Chem. Phys., vol. 125, 184902, 2006.

121. I. Pivkin* and G.E. Karniadakis, "Controlling density fluctuations in wall-bounded dissipative particle dynamics systems", Phys. Rev. Let., vol 96 (20), 206001, 2006.

122. V. Symeonidis* and G.E. Karniadakis, "A family of time-staggered schemes for integrating hybrid DPD models for polymers: Algorithms and applications", J. Comp. Phys., vol. 218, pp. 82-101, 2006.

123. I. Pivkin* and G.E. Karniadakis, "Coarse-graining limits in open and wall-bounded DPD systems", J. Chem. Phys., vol. 124, 184101, 2006.

124. E. Keaveny, I. Pivkin*, M.R. Maxey and G.E. Karniadakis, "A comparative study between dissipative particle dynamics and molecular dynamics for simple-and complex-geometry flows", J. Chem. Phys., vol. 123, p. 104-107, 2005.

125. V. Symeonidis*, G.E. Karniadakis and B. Caswell, "Dissipative particle dynamics simulations of polymer chains: Scaling laws and shearing response compared to DNA experiments", Phys. Rev. Lett., vol 95, 076001, 2005.

126. I. Pivkin*, P.D. Richardson, D.H. Laidlaw and G.E. Karniadakis, "Combined effects of pulsatile flow and dynamic curvature on wall shear stress in a coronary artery bifurcation model", J. Biomechanics, vol. 38, pp. 1283- 1290, 2005.

127. I. Pivkin* and G.E. Karniadakis, "A new method to impose no-slip boundary conditions in dissipative particle dynamics", J. Comp. Phys., vol. 207, pp. 114-128, 2005.

128. V. Symeonidis*, G.E. Karniadakis and B. Caswell, "A seamless approach to multiscale complex fluid simulation", Computing in Science Engineering, pp. 39-46, May/June 2005.

129. A. Beskok* and G.E. Karniadakis, "A model for flows in channels, pipes and ducts at micro-and nano-scales", J. Microscale Thermophysical Engineering, vol. 3, pp. 43-77, 1999.

130. A. Beskok*, G.E. Karniadakis and W. Trimmer, "Rarefaction and compressibility effects in gas microflows, J. Fluids Engineering, vol. 118, p. 448, 1996.

131. S.J. Sherwin*, G.E. Karniadakis S.A. Orszag, "Numerical simulation of the ion etching process," J. Comp. Phys., vol. 110, p. 373, 1994.

132. A. Beskok* and G.E. Karniadakis, "Simulation of heat and momentum transfer in complex micro-geometries," J. Thermophys. and Heat Transfer, vol. 8, no. 4, p. 647, 1994.

133. M.K. Sharp, R. D. Kamm, A.H. Shapiro, E. Kimmel G.E. Karniadakis, "Dispersion in a curved tube during oscillatory flow," J. Fluid Mech., vol. 223, p. 537, 1991.

134. S.J. Sherwin*, E. Barough, G.E. Karniadakis S.A. Orszag, "Modeling of multilayer etching processes," J. of Vacuum Science and Technology, vol. 11, p. 1310, 1993.

Fluid Mechanics

1. Z Wang, D Fan, MS Triantafyllou, GE Karniadakis, A large-eddy simulation study on the similarity between free vibrations of a flexible cylinder and forced vibrations of a rigid cylinder, Journal of Fluids and Structures 101, 103223, 2021.

2. D Fan, Z Wang, MS Triantafyllou, GE Karniadakis, Mapping the properties of the vortex-induced vibrations of flexible cylinders in uniform oncoming flow, Journal of Fluid Mechanics 881, 815-858, 2019.

3. Z Wang, MS Triantafyllou, Y Constantinides, GE Karniadakis, An entropy-viscosity large eddy simulation study of turbulent flow in a flexible pipe, Journal of Fluid Mechanics 859, 691-730, 2019.

4. A Yakhot, Y Feldman, D Moxey, S Sherwin, GE Karniadakis, Turbulence in a Localized Puff in a Pipe Flow, Turbulence and Combustion, 1-24, 2019.

5. F. Xie, X. Zheng, Y. Constantinides, M.S. Triantafyllou, and G.E. Karniadakis, "The flow dynamics of the garden- hose instability", J. Fluid Mech., 800, pp. 595–612, 2016, doi:10.1017/jfm.2016.364, 2016.

6. F. Xie, Y. Yu, Y. Constantinides, M.S. Triantafyllou, and G.E. Karniadakis, "U-shaped fairings suppress vortex- induced vibrations for cylinders in cross-flow", J. Fluid Mech., 782, 300-332, 2015.

7. Y. Yu, F. Xie, H. Yan, Y. Constantinides, O. Oakley and G.E. Karniadakis, "Suppression of vortex-induced vibrations by fairings: A numerical study", J. Fluids and Structures, 54, 679-700, 2015.

8. R. Bourguet, G.E. Karniadakis and M.S. Triantafyllou, "On the validity of the independence principle applied to the vortex-induced vibrations of a flexible cylinder inclined at 60deg", J. Fluids and Structures, vol. 53, pp. 58-69, 2015.

9. R. Bourguet, G.E. Karniadakis and M.S. Triantafyllou, "Multi-frequency vortex-induced vibrations of a long tensioned beam in linear and exponential shear flows", J. Fluids and Structures, 41(8):33-42, 2013.

10. R. Bourguet, G.E. Karniadakis and M.S. Triantafyllou, "Distributed lock-in drives broadband vortex-induced vibrations of a long flexible cylinder in shear flow", J. Fluid Mech., vol. 717, pp. 361-375, 2013.

11. R. Bourguet, G.E. Karniadakis and M.S. Triantafyllou, "Phasing mechanisms between the in-line and cross-flow vortex-induced vibrations of a long tensioned beam in shear flow", Computers and Structures, 122(6):155-163, 2013.

12. R. Bourguet, Y. Modarres-Sadeghi, G.E. Karniadakis and M.S. Triantafyllou, "Wake-body resonance of long flexible structures is dominated by counter-clockwise orbits", Phys. Rev. Lett., vol. 107, 134502, 2011.

13. R. Bourguet, G.E. Karniadakis and M.S. Triantafyllou, "Lock-in of the vortex-induced vibrations of a long tensioned beam in shear flow", J. Fluids Structures, vol. 27, pp. 838-847, 2011.

14. R. Bourguet, G.E. Karniadakis and M.S. Triantafyllou, "Vortex-induced vibrations of a long flexible cylinder in shear flow", J. Fluid Mech., vol. 667, pp. 342-382, 2011.

15. H. Baek* and G.E. Karniadakis, "Suppressing vortex-induced vibrations via passive means", J. Fluids Structures, vol. 25(5), pp. 848-866, 2009.

16. D. Liu*, E. Keaveny, M.R. Maxey and G.E. Karniadakis, "Force coupling method for flows with ellipsoidal particles", J. Comp. Phys., vol. 228, pp. 3559-3581, 2009.

17. S. Dong, G.S. Triantafyllou and G.E. Karniadakis, "Elimination of vortex streets in bluff-body flows", Phys. Rev. Let., vol 100, 204501, 2008.

18. J.M. Dahl, F.S. Hover, M.S. Triantafyllou, S. Dong and G.E. Karniadakis, "Resonant vibrations of bluff bodies cause multivortex shedding and high frequency forces", Phys. Rev. Let., vol 99, (14), 144503, 2007.

19. J. Xu*, S. Dong, M.R. Maxey and G.E. Karniadakis, "Turbulent drag reduction by constant near-wall forcing", J. Fluid Mech., vol. 582, pp. 79-101, 2007.

20. E. Climent, K. Yeo, M.R. Maxey and G.E. Karniadakis, "Dynamic self-assembly of spinning particles", J. Fluids Engin., vol. 129, pp. 379-387, 2007.

21. G.V. Papaioannou, D.K.P. Yue, M.S. Triantafyllou and G.E. Karniadakis, "Three-dimensionality effects in flow around two tandem cylinders", J. Fluid Mech., vol. 558, pp. 387-413, 2006.

22. G.V. Papaioannou, D.K.P. Yue, M.S. Triantafyllou and G.E. Karniadakis, "Evidence of holes in the Arnoldi tongues in flow past two oscillating cylinders", Phys. Rev. Lett., vol 96, 014501, 2006.

23. S. Dong, G.E. Karniadakis, A. Ekmekci and D. Rockwell, "A combined DNS-PIV study of the turbulent near-wake", J. Fluid Mech., vol. 569, pp. 185-207, 2006.

24. D. Lucor*, J. Foo*, and G.E. Karniadakis, "Vortex mode selection of a rigid cylinder subject to VIV at low mass- damping", Journal of Fluids Structures, vol. 20(4), pp. 483-503, 2005.

25. S. Dong and G.E. Karniadakis, "DNS of flow past a stationary and oscillating cylinder at Re = 10000", Journal of Fluids Structures, vol. 20(4), pp. 519-531, 2005.

26. D. Liu*, M.R. Maxey and G.E. Karniadakis, "Simulations of dynamic self-assembly of paramagnetic microspheres in confined microgeometries", Journal of Micromechanics and Microengineering, vol. 15, pp. 2298-2308, 2005.

27. E. Climent, M.R. Maxey and G.E. Karniadakis, "Dynamics of self-assembled chaining in magnetorheological fluids", Langmuir, vol. 20(2), pp. 507-513, 2004.

28. D. Liu*, M.R. Maxey and G.E. Karniadakis, "Modeling and optimization of colloidal micro-pumps", Journal of Micromechanics and Microengineering, vol. 14, pp. 567-575, 2004. (Top 3% of downloads across all IOP journals.)

29. S. Sirisup*, G.E. Karniadakis, N. Saelim and D. Rockwell, "DNS and experiments of flow past a wired cylinder at low Reynolds number", European Journal of Mechanics B/Fluids, vol. 23, pp. 181-188, 2004.

30. D. Lucor* and G.E. Karniadakis, "Effects of Oblique inflow in vortex-induced vibrations", Flow, Turbulence and Combustion, vol. 71, pp. 375-389, 2003.

31. X. Ma*, V. Symeonidis* and G.E. Karniadakis, "A spectral vanishing viscosity method for stabilizing viscoelastic flows", J. Non-Newtonian Fluid Mechanics, vol. 115, pp. 125-155, 2003.

32. J. Xu*, S. Dong, M.R. Maxey and G.E. Karniadakis, "Direct numerical simulation of turbulent channel flow with bubbles", Contemporary Mathematics, vol. 329, pp. 347-354, 2003.

33. J. Xu*, M. Maxey and G.E. Karniadakis, "Numerical simulation of turbulent drag reduction using micro-bubbles", J. Fluid Mech., vol. 468, pp. 271-281, 2002.

34. D. Lucor*, C. Evangelinos*, L. Imas and G.E. Karniadakis, "Flow-induced vibrations of non-linear cables, Part II: Simulations", Int. J. Num. Meth. Engin., vol. 55, pp. 557-571, 2002.

35. Y. Du*, V. Symeonidis* and G.E. Karniadakis, "Drag reduction in wall-bounded turbulence via a transverse traveling wave", J. Fluid Mech., vol. 457, pp. 1-34, 2002.

36. D. Lucor*, L. Imas and G.E. Karniadakis, "Vortex dislocations and force distribution of long flexible cylinders subjected to sheared flows", J. Fluids Structures, vol. 15, pp. 641-650, 2001.

37. Y. Du* and G.E. Karniadakis, "Suppressing wall turbulence by means of a transverse traveling wave", Science, vol. 288, pp. 1230-1234, 2000.

38. X. Ma*, G.-S. Karamanos* and G.E. Karniadakis, "Dynamics and low-dimensionality in the turbulent near-wake", J. Fluid Mech., vol. 410, pp. 29-65, 2000.

39. C. Evangelinos*, D. Lucor* and G.E. Karniadakis, "DNS-derived force distribution on flexible cylinders subject to vortex-induced vibration", J. Fluid Mech., vol. 14(3), pp. 429-440, 2000.

40. G.E. Karniadakis, "Simulating turbulence in complex geometries", Fluid Dynamics Research, vol. 24 (6), pp. 343- 362, 1999.

41. C. Evangelinos* and G.E. Karniadakis, "Dynamics and flow structures in the turbulent wake of rigid and flexible cylinders subject to vortex-induced vibrations", J. Fluid Mech., vol. 400, pp. 91-124, 1999.

42. D.J. Newman* and G.E. Karniadakis, "Simulations of flow past a freely vibrating cable," J. Fluid Mech., vol. 344, p.95, 1997.

43. C.H. Crawford* and G.E. Karniadakis, "Reynolds stress analysis of EMHD-controlled wall turbulence, Part I: Stream-wise forcing, Phys. Fluids, vol. 9(3), 1997.

44. D.J. Newman* and G.E. Karniadakis, "Simulations of flow over a flexible cable: A comparison of forced and flow- induced vibrations," J. Fluids Structures, vol. 10, p. 439, 1996.

45. L. Kaiktsis, G.E. Karniadakis and S.A. Orszag, "Unsteadiness and convective instabilities in flow over a backward- facing step," J. Fluid Mech., vol. 321, p. 157, 1996.

46. G.E. Karniadakis and G.L. Brown, "Vorticity transport in modeling three-dimensional unsteady shear flows," Phys. Fluids, vol 7(4), p. 688, 1995.

47. D. Chu* G.E. Karniadakis, "A direct numerical simulation of laminar and turbulent flow over riblet-mounted surfaces," J. Fluid Mech., vol. 250, p.1, 1993.

48. M.V. Zagarola, A.J. Smits G.E. Karniadakis, "Heat transfer enhancement in transitional channel flow," J. Wind Engineering Industrial Aerodynamics, vol. 49, p. 257, 1993.

49. D. Chu*, R.D. Henderson* G.E. Karniadakis, "Parallel spectral element-Fourier simulation of turbulence over ribletmounted surfaces," Theor. Comput. Fluid Dynamics, vol. 3, p.219, 1992.

50. A.G. Tomboulides*, G.S. Triantafyllou G.E. Karniadakis, "A new mechanism of period doubling in free shear flows," Phys. Fluids, vol. 4 (7), p. 1329, 1992.

51. G.E. Karniadakis G.S. Triantafyllou, "Three-dimensional dynamics and transition to turbulence in the wake of bluff objects," J. Fluid Mech., vol. 238, p. 1, 1992.

52. P.F. Batcho* G.E. Karniadakis, "Chaotic transport in two-and three-dimensional flow past a cylinder," Phys. Fluids, vol. 3(5), p. 1051, 1991.

53. D. Barkley, G.E. Karniadakis, I.G. Kevrekidis, A.J. Smits Z.H. Shen, "Chaotic advection in a complex annular geometry," Phys. Fluids, vol. 3(5), p. 1063, 1991.

54. L. Kaiktsis*, G.E. Karniadakis S.A. Orszag, "Onset of three-dimensionality, equilibria, and early transition in flow over a backward-facing step," J. Fluid Mech., vol. 231, p. 501, 1991.

55. P.F. Batcho*, G.E. Karniadakis S.A. Orszag, "Numerical investigation of the spreading of self-excited stratified jets," ASME Symp. on Unsteady Flows, Toronto, 1990, also in J.Fluids Structures, vol. 5, p. 681-700, 1991.

56. G.S. Triantafyllou G.E. Karniadakis, "Computational reducibility of unsteady viscous flows," Phys. Fluids, vol. 2, p. 653, 1990.

57. G.E. Karniadakis G.S. Triantafyllou, "Frequency selection and asymptotic states in laminar wakes," J. Fluid Mech., vol. 199, p. 447, 1989.

58. G.E. Karniadakis G.S. Triantafyllou, "The crisis of transport measures in chaotic flow past a cylinder," Phys. Fluids, vol. 4, p. 628, 1989.

59. G.E. Karniadakis, B.B. Mikic A.T. Patera, "Transport enhancement by flow destabilization: Reynolds' analogy revisited," J. Fluid Mech., vol. 192, p. 365, 1988.

60. G.E. Karniadakis, "Numerical simulation of forced convection heat transfer from a cylinder in crossflow," Int. J. Heat Mass Transfer, vol. 31, p. 107, 1988.

Low-Dimensional Modeling

1. X. Yang*, D. Venturi, C. Cheng, C. Chryssostomidis and G.E. Karniadakis, "EOF-based constrained sensor placement and field reconstruction from noisy ocean measurements: Application to Nantucket Sound", J. Geophys. Res. Oceans, vol. 115, C12072, 2010.

2. B. Yildirim*, C. Chryssostomidis and G.E. Karniadakis, "Efficient Sensor Placement for Ocean Measurements using Low-dimensional Concepts", Ocean Modelling, vol. 27, pp. 160-173, 2009.

3. S. Sirisup*, G.E. Karniadakis, D. Xiu and I.G. Kevrekidis, "Equation-free/Galerkin-free POD-assisted computation of incompressible flows", Journal of Computational Physics, vol. 207(2), pp. 568-587, 2005.

4. S. Sirisup*, G.E. Karniadakis, "Stability and accuracy of periodic flow solutions obtained by a POD-penalty method", Physica D, vol. 202, pp. 218-237, 2005.

5. S. Sirisup*, G.E. Karniadakis, "A spectral viscosity method for correcting the long-term behavior of POD models", J. Comp. Phys., vol. 194, pp. 92-116, 2004.

6. S. Sirisup*, G.E. Karniadakis, Y. Yang and D. Rockwell, "Wave-structure interaction: simulation driven by quantitative imaging", Proc. R. Soc. Lond. A, vol. 460, pp. 729-755, 2004.

7. X. Ma*, G.E. Karniadakis, H. Park and M. Gharib, "DPIV-Driven simulation: A new computational paradigm", Proc. Royal Soc. A, vol. 459, pp. 547-565, 2003.

8. X. Ma*, G.E. Karniadakis, H. Park and M. Gharib, "DPIV/T-Driven convective heat transfer simulation", Int. J. Heat Mass Transfer, vol. 45, pp. 3517-3527, 2002.

9. X. Ma* and G.E. Karniadakis, "A low-dimensional model for simulating 3D cylinder flow", J. Fluid Mech., vol. 458, pp. 181-190, 2002.

10. A.K. Bangia, P.F. Batcho*, I.G. Kevrekidis and G.E. Karniadakis, "Unsteady 2D flows in complex geometries: Comparative bifurcation studies with global eigenfunction expansions," SIAM J. Sci. Stat. Comp., vol. 18, p. 775, 1997.

11. P. F. Batcho* G.E. Karniadakis, "Generalized Stokes eigenfunctions: A new trial basis for the incompressible Navier-Stokes equations," J. Comp. Phys., vol 115, p. 121, 1994.

12. A.E. Deane, I.G. Kevrekidis, G.E. Karniadakis S.A. Orszag, "Low-dimensional models for complex geometry flows: Application to grooved channels and circular cylinders," Phys. Fluids, vol. 3(10), p. 2337, 1991.

Parallel Computing

1. A. L. Blumers, Y. Tang, Z. Li, X. Li, G. E. Karniadakis, "GPU-accelerated red blood cells simulations with transport dissipative particle dynamics." Computer Physics Communications, 2017, http://dx.doi.org/10.1016/j.cpc.2017.03.016

2. P. Perdikaris, J.A. Insley, L. Grinberg, Y. Yu, M. Papka and G.E. Karniadakis, "Visualizing multiphysics, fluid- structure interaction phenomena in intracranial aneuryms," In Press: Parallel Computing, 55, 9-16, 2016.

3. Y-H. Tang, S. Kudo, X. Bian, Z. Li and G.E. Karniadakis, "Multiscale universal interface: A concurrent framework for coupling heterogeneous solvers," J. Comp. Phys., 297, 13-31, DOI: 10.1016/j.jcp.2015.05.004, 2015.

4. Y.-H. Tang and G.E. Karniadakis, "Accelerating Dissipative Particle Dynamics Simulations on GPUs: Algorithms, Numerics and Applications", Comput. Phys. Commun., 185, 2809-2822, 2014.

5. L. Grinberg, D. Fedosov and G. E. Karniadakis, "Parallel multiscale simulations of a brain aneurysm", Journal of Computational Physics, 244:131-147, 2013.

6. L. Grinberg, J. Insley , D. Fedosov, V. Morozov, M. Papka and G. E. Karniadakis, "Tightly Coupled Atomistic- continuum Simulations of Brain Blood Flow on Petaflop Supercomputers, Computing in Science and Engineering", vol. 14(6), p. 58-67, 2012.

7. L. Grinberg* and G.E. Karniadakis, "A new domain decomposition method with overlapping patches for ultrascale simulations: Application to biological flows", J. Comp. Phys., vol. 229, pp. 5541-5563, 2010.

8. L. Grinberg*, D. Pekurovsky, S. Sherwin and G. E. Karniadakis, "Parallel performance of the coarse space linear vertex solver and low energy basis preconditioner for spectral/hp elements", Parallel Computing, vol. 35, pp. 284- 304, 2009.

9. L. Grinberg* and G.E. Karniadakis, "A scalable domain decomposition method for ultra-parallel arterial flow simulations", Commun. Comput. Phys., vol. 4, pp. 1151-1169, 2008.

10. S. Dong, J. Insley, N.T. Karonis, M. Papka, J. Binns and G.E. Karniadakis. "Simulating and visualizing the human arterial system on the TeraGrid", Future Generation Computer Systems, The International Journal of Grid Computing: Theory, Methods and Applications, vol. 22, pp. 1011-1017, 2006.

11. S. Dong, G.E. Karniadakis and N. Karonis, "Cross-Site Computations on the TeraGrid", Computing in Science Engineering, vol. 7(5), 14-23, 2005.

12. S. Dong and G.E. Karniadakis, "Dual-level parallelism for high-order CFD methods", Parallel Computing, vol. 30(1), pp. 1-20, 2004. (Ten most downloaded articles in Parallel Computing).

13. S. Dong and G.E. Karniadakis, "Multilevel parallelization models in CFD", Journal of Aerospace Computing, Infor- mation and Communication, vol. 1, pp. 256-268, 2004.

14. J.S. Sobel, A.S. Forsberg, D.H. Laidlaw, R.C. Zelesnik, D.F. Keefe, I. Pivkin*, G.E. Karniadakis, P. Richardson and

15. S. Swartz, "Particle Flurries", IEEE Computer Graphics and Applications, vol. 24(2), pp. 76-85, 2004.

16. S. Dong and G.E. Karniadakis, "P-refinement and P-threads", Comput. Methods Appl. Mech. Engrg., vol. 192, pp. 2191-2201, 2003.

17. C. Evangelinos*, S.J. Sherwin and G.E. Karniadakis, "Parallel DNS algorithms on unstructured grids", Comp. Meth. Appl. Mech. Engr., vol. 184, pp. 401-425, 2000.

18. C. Evangelinos* and G.E. Karniadakis, "Parallel CFD Benchmarks on Cray Computers," Parallel Algorithms and Applications, vol. 9, p. 273, 1996, also in Proc. Int. Conf. Parallel Algorithms, October 1995, Wuhan, China (invited presentation).

19. C.H. Crawford*, C. Evangelinos*, D.J. Newman* and G.E. Karniadakis, "Parallel benchmarks of turbulence in complex geometries," Computers and Fluids, vol. 25, p. 677, 1996, also in Proc. Parallel CFD'95, June 26-29, 1995, Pasadena, CA.

20. P. Fischer, L.W. Ho, G.E. Karniadakis, E.M. Ronquist A.T. Patera, "Recent advances in parallel spectral element simulation of unsteady incompressible flows," Comp. Structures, vol. 30, p. 217, 1988.

Articles in Proceedings (refereed/invited papers or extended abstracts of papers were refereed)

1. Rossinelli, D., Tang, Y.-H., Lykov, K., Alexeev, D., Bernaschi, M., Hadjidoukas, P., Bisson, M., Joubert, W., Conti, C., Karniadakis G., Fatica, M., Pivkin, I., Koumoutsakos, P, "The In-Silico Lab-on-a-Chip: Petascale and High- Throughput Simulations of Microfluidics at Cell Resolution", ACM 2015 Gordon Bell Award Finalist, Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis. 2015.

2. L. Grinberg, M. Deng, H. Lei, J. A. Insley and G. E. Karniadakis, "Multiscale Simulations of Blood-Flow: From a Platelet to an Artery", In Proceedings of the 1st Conference of the Extreme Science and Engineering Discovery Environment: Bridging from the eXtreme to the campus and beyond (XSEDE), Chicago, IL. (2012).

3. J. A. Insley, L. Grinberg, M. E. Papka, "Visualization of Multiscale Simulation Data: Brain Blood Flow", TeraGrid 11 Conference, Salt Lake City, UT, (2011).

4. L. Grinberg*, V. Morozov, D. Fedosov, J. Insley, M.E. Papka, K. Kumar, and G.E. Karniadakis, "A new Computational Paradigm in Multiscale Simulations: Application to Brain Blood Flow", In Proceedings of the 2011 International Conference for High Performance Computing, Networking, Storage and Analysis, SC'11. (Gordon Bell Prize finalist) (2011).

5. L. Grinberg* and G.E. Karniadakis, "Parallel Paradigm for Ultraparallel Multi-Scale Brain Blood Flow Simulations", Proceedings of the Second International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering, (2011).

6. J. A. Insley, L. Grinberg, M. E. Papka, "Visualizing Multiscale Simulation Data: Brain Blood Flow", Proceedings of IEEE Symposium on Large-Scale Data Analysis and Visualization, Providence, RI, (2011).

7. Z. Zhang*, M. Choi* and G.E. Karniadakis, "Anchor points matter in ANOVA decomposition", Proceedings of ICOSAHOM'09, Springer, eds. E. Ronquist J. Hesthaven, 2010.

8. M. Milosevic-Marden, P. Prempraneerach, J. Kirtley, G.E. Karniadakis, and C. Chryssostomidis, "An end-to-end simulator for the all-electric-ship MVDC integrated power system", Proceedings of Grand Challenges in Modeling Simulation, Simulation Multi-Conference, July 2010, Ottawa, Canada.

9. X. Luo, B. Epps, C. Chryssostomidis and G.E. Karniadakis, "Comparison of turbulence models for simulating flow in waterjets", Proceedings of 11th International Conference on Fast Sea Transportation, 26-29 September, 2011, Honolulu, Hawaii.

10. X. Luo, C. Chryssostomidis and G.E. Karniadakis, "Spectral element/Smoothed profile method for turbulent flow simulations of waterjet propulsion systems", Proceedings of Grand Challenges in Modeling Simulation, Simulation Multi-Conference, July 2010, Ottawa, Canada.

11. X. Luo, C. Chryssostomidis and G.E. Karniadakis, "Fast 3D flow simulations of a waterjet propulsion system", Pro- ceedings of International Simulation Multi-Conference, July 2009, Instabul, Turkey.

12. P. Prempraneerach, J. Kirtley, C. Chryssostomidis, M. Triantafyllou, and G.E. Karniadakis, "Design of the all- electric ship: focus on integrated power system coupled to Hydrodynamics", Proceedings of the Electric Ship Design Symposium, : Back to the Future; presented by the Society of Naval Architects and Marine Engineers (SNAME) and the American Society of Naval Engineers (ASNE); National Harbor, MD, February 12-13, 2009.

13. G. Lin and G.E. Karniadakis, "Stochastic Simulations and Sensitivity Analysis of Plasma Flow", AIAA 2008-1073, 46th Aerospace Sciences Meeting Exhibit, Reno, NV, January 7-10, 2008.

14. X. Wan and G. E. Karniadakis, "Recent advances in polynomial chaos methods", Proceedings of the Applied Vehicle Technology Panel (AVT) Symposium: Computational Uncertainty in Military Vehicle Design (NATO/PfP Unclassified), 3-6 December 2007, Greece, Athens.

15. H. Baek, M.V. Jayaraman, and G.E. Karniadakis, "Distribution of WSS on the internal carotid artery with an aneurysm: A CFD sensitivity study", ASME Proceedings, IMECE2007, 11-15 November, Seattle, WA., 2007.

16. S. Dong, N.T. Karonis and G.E. Karniadakis. "Grid solutions for biological and physical cross-site simulations on the TeraGrid", In Proceedings of 20th IEEE International Parallel and Distributed Processing Symposium (IPDPS'06), Rhodes Island, Greece, April 2006.

17. B. Boghosian, P. Coveney, S. Dong, L. Finn, S. Jha, G.E. Karniadakis and N.T. Karonis. "Nektar, SPICE and Vortonics: Using Federated Grids for Large Scale Scientific Applications", Workshop on Challenges of Large Applications in Distributed Environments (CLADE), in conjunction with 15th International Symposium on High Performance Distributed Computing (HPDC-15), Paris, France, June 2006.

18. G. Lin*, C.-H. Su and G.E. Karniadakis, "Modeling uncertainties in supersonic flow past a wedge", 44th Aerospace Sciences Meeting and Exhibit, Reno, Nevada, January 9-12, 2006.

19. G. Lin*, C.-H. Su and G.E. Karniadakis, "Stochastic solvers for the Euler equations", 43rd Aerospace Sciences Meeting and Exhibit, Reno, Nevada, January 10-13, 2005.

20. X. Wan* and G.E. Karniadakis, "Simulation of heat transfer with uncertainty", Proc. of HT2005, ASME Summer Heat Transfer Conference, San Francisco, CA, July 17-22, 2005.

21. I. Pivkin*, E. Hueso, R. Wienstein, D.H. Laidlaw, S. Swartz and G.E. Karniadakis, "Simulation and visualization of airflow around bat wings during flight", International Conference on Computational Science (2), pp. 689-694, 2005.

22. E. Hueso, I. Pivkin*, S. Swartz, D.H. Laidlaw, G.E. Karniadakis and K. Breuer, "Visualization of vortices in simulated airflow around bat wings during flight", IEEE Visualization, 2004.

23. J. Xu*, S. Dong, M.R. Maxey and G.E. Karniadakis, "Wall-slippage effect in microbubble drag reduction", 2nd International Symposium on Seawater Drag Reduction, Busan, Korea, May 23-26, 2005.

24. S. Dong, J. Xu*, M.R. Maxey and G.E. Karniadakis, "Microbubble dynamics in turbulent channel flow", 2nd International Symposium on Seawater Drag Reduction, Busan, Korea, May 23-26, 2005.

25. M.R. Maxey, D. Liu*, S. Dong and G.E. Karniadakis, "New advances in Force-Coupling Method: from Micro to Macro", IUTAM Symposium on Computational Approaches to Disperse Multiphase Flow, Argonne, Illinois, 4-7 October, 2004.

26. I.V. Pivkin*, P.D. Richardson and G.E. Karniadakis, "Simulation of mural platelet aggregation", In BMES 2004 Annual Fall Meeting, Philadelphia, PA, October 2004.

27. D. Lucor*, C.-H. Su and G.E. Karniadakis, "Karhunen-Loeve representation of periodic second-order autoregressive processes", International Conference on Computational Science, Krakow, Poland, June 6-9, 2004.

28. X. Wan*, D. Xiu* and G.E. Karniadakis, "Modeling uncertainty in three-dimensional heat transfer problems", Heat Transfer Conference, Lisbon, Portugal, March 24-26, 2004.

29. M.R. Maxey, D. Liu*, G.E. Karniadakis and E. Climent, "Self-assembled particle structures for microflow systems", Paper No. K02, Proc. 5th International Conference on Multiphase Flow, ICMF'04, Yokohama, Japan, May 30-June 4, 2004.

30. M.R. Maxey, J.Xu*, S. Dong and G.E. Karniadakis, "Simulation Results for Micro-bubbles and Turbulent Drag Re- duction," Proceedings of FEDSM'03, 4th ASME-JSME Joint Fluids Engineering Conference, Honolulu, Hawaii, July 6-11 2003.

31. D. Lucor*, J. Foo*, and G.E. Karniadakis, " "Correlation length and force phasing of a rigid cylinder subject to VIV", IUTAM Symposium on Integrated Modeling of Fully Coupled Structure Interactions Using Analysis, Computations and Experiments, Eds. H. Benaroya and T. Wei, Kluwer Academic Publishers, p. 187, 2003.

32. J. Xu*, M.R. Maxey, and G.E. Karniadakis, "DNS of Turbulent Drag Reduction Using Micro-bubbles," AIAA2003- 1280, 41st Aerospace Sciences Meeting and Exhibit, Reno, Nevada, January 6-9 2003.

33. D. Lucor*, X. Ma*, M.S. Triantafyllou and G.E. Karniadakis, "Vortex-induced Vibrations on Long Marine Risers in Sheared Flows: DSN Studies," Proceedings of FEDSM'03, 4th ASME-JSME Joint Fluids Engineering Conference, Honolulu, Hawaii, July 6-11 2003.

34. D. Liu*, M.R. Maxey and G.E. Karniadakis, "FCM-Spectral Element Method for Simulating Colloidal Micro- Devices," 2nd MIT Conference on Computational Fluid and Solid Mechanics, edited by K.J. Bathe, June 17-20 2003.

35. Z. Yosibash, R.M. Kirby*, K. Myers, B. Szabo, G.E. Karniadakis, "High-order Finite Elements for Fluid-Structure Interaction Problems," 4th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics and Materials Conference, April 7-10 2003, Norfolk, Virginia.

36. D. Lucor* and G.E. Karniadakis, "Predictability and Uncertainty in Flow-Structure Interactions", Proceedings of the Third Conference on Bluff Body Wakes and Vortex-Induced Vibrations, Port Douglas, Australia, December 2002.

37. S. Sirisup and G.E. Karniadakis, "Direct numerical simulation of flow past a wired cylinder", Proceedings of the Third Conference on Bluff Body Wakes and Vortex-Induced Vibrations, Port Douglas, Australia, December 2002.

38. S. Dong and G.E. Karniadakis, "Dual Level Parallelism for Deterministic and Stochastic CFD Problems",

39. Proceedings of Supercomputing 2002, Baltimore, November 2002.

40. D. Xiu* and G.E. Karniadakis, "Modeling Uncertainty of Elliptic Partial Differential Equations via Generalized Poly- nomial Chaos", Proceedings of the 5th ASCE Engineering Mechanics Division Conference, Columbia University, New York City, June 2002.

41. D. Xiu* and G.E. Karniadakis, "Uncertainty Modeling of Burgers' Equation by Generalized Polynomial Chaos", Proceedings of the 4th International Conference on Computational Stochastic Mechanics, Corfu, Greece, June 2002.

42. I. Pivkin*, D.H. Laidlaw, P. Richardson and G.E. Karniadakis, "Moving meshes and flow simulations in coronary arteries", Proceedings of the 8th International Conference on Numerical Grid Generation in Computational Field Simulations, p. 467, Honolulu, Hawaii, June 2002.

43. J. Sobel, A.S. Forsberg, P. Richardson, D.H. Laidlaw, D.F. Keefe, I. Pivkin* and G.E. Karniadakis, "Arterial flows seen in virtual reality", Proceedings of the 21st Southern Biomedical Engineering Conference, pp. 349-350, 2002.

44. I. Pivkin*, R.M. Kirby* and G.E. Karniadakis, "High-order discontinuous Galerkin methods: Simulation of COIL flows", Proc. Third AFOSR DNS/LES Conference, 2001.

45. G. Lin* and G.E. Karniadakis, "A High-order discontinuous Galerkin method for modeling micro pulsed plasma thrusters", Proc. International Electric Propulsion Conference, Pasadena, CA, 2001.

46. D. Liu*, M. Maxey and G.E. Karniadakis, "A fast algorithm for particulate microflows in complex geometries", Proc. ASME, November 2001.

47. B. Pulvirenti, X. Ma* and G.E. Karniadakis, "A POD-based nonlinear Galerkin method for flow-thermal problems", Proc. ECCOMAS, September 2001.

48. D. Lucor*, D. Xiu* and G.E. Karniadakis, "Modeling uncertainty in flow-structure interactions", Proc. First MIT Conference, June 2001.

49. D. Lucor*, C. Evangelinos* and G.E. Karniadakis, "DNS-derived force distribution on flexible cylinders subject to VIV with shear inflow", Proc. in Flow Induced Vibration, eds. Ziada Staubli, Bakelma, Rotterdam, 2000.

50. R.M. Kirby*, Y. Du*, D. Lucor*, X. Ma*, G.-S. Karamanos and G.E. Karniadakis, "Parallel DNS and LES of turbulence and flow-structure interactions", Proceedings of the DoD HPCMP Users Group Conference, June 5-8, 2000.

51. A. Forsberg, R.M. Kirby*, D.H. Laidlaw, G.E. Karniadakis, A. van Dam and J. Elion, "Immersive virtual reality for visualizing flow through an artery", Proc. IEEE Visualization 2000, Salt Lake City, UT, October 2000.

52. G.-S. Karamanos, C. Evangelinos*, R. Boes, R.M. Kirby* and G.E. Karniadakis, "DNS of turbulence on a PC/Linux cluster: Fact or Fiction?", Proc. SuperComputing 1999.

53. R.M. Kirby*, I. Lomtev*, C. Evangelinos*, G.-S. Karamanos and G.E. Karniadakis, "Parallel DNS of flow-structure interactions", Proceedings of the DoD HPCMP Users Group Conference, June 7-10, 1999.

54. I. Lomtev*, R.M. Kirby*, and G.E. Karniadakis, "A discontinuous Galerkin method in moving domains", In Proc. of Discontinuous Galerkin Methods: Theory, Computation and Applications, eds. Cockburn et al. , Springer-Verlag, NY, 1999.

55. I. Lomtev*, R.M. Kirby*, and G.E. Karniadakis, "DNS for flow past a 3D flexible wing", Proc. of Second AFOSR Conference, Rutgers, June 7-9, 1999, published by Kluwer, eds. D. Knigh L. Sakell.

56. R.M. Kirby*, T.C. Warburton*, S.J. Sherwin*, A. Beskok* and G.E. Karniadakis, "The Nektar Code: Dynamic Simulations without Remeshing" Proc. 2nd International Conference on Computational Technologies for Fluid/Thermal/Chemical Systems with Industrial Applications, August 1-5, 1999.

57. X. Ma*, G.E. Karniadakis, G. Karamanos and S.J. Sherwin*, "Issues in LES of wake flows", AIAA 98-2893, 29th AIAA Fluid Dynamics Conference, Albuquerque, NM, June 15-18, 1998.

58. T.C. Warburton*, I. Lomtev*, R.M. Kirby*, and G.E. Karniadakis, "A discontinuous Galerkin method for the com- pressible Navier-Stokes equations on hybrid grids", Proc. Tenth International

Conference on Finite Elements in Fluids, January 5-8, 1998, Tucson, Arizona, p. 604, Eds. M. Hafiz and J.C. Heinrich.

59. H. Marmanis*, Y. Du*, C.H. Crawford*, and G.E. Karniadakis, "Turbulence control via geometry modifications and electromagnetic fields", Proc. ECCOMAS 98, Athens, Greece, 1998.

60. C.H. Crawford*, H. Marmanis*, and G.E. Karniadakis, "The Lamb vector and its divergence in turbulent drag reduction", Proc. Int. Symposium on Seawater Drag Reduction, Newport, RI, July 22-24, 1998.

61. Y. Du*, C.H. Crawford*, and G.E. Karniadakis, "Lorentz force modeling in EMHD turbulence control: DNS studies", Proc. Int. Symposium on Seawater Drag Reduction, Newport, RI, July 22-24, 1998.

62. C.E. Evangelinos* and G.E. Karniadakis, "Correlation length and forces in flow past a freely-oscillating cylinder", Proc. ASME Fluids Engineering Division Summer Meeting, eds. P. Bearman and C.H.K. Williamson, Washington DC, June 21-25, 1998.

63. H.F. Liu*, N. Gatsonis, A. Beskok* and G.E. Karniadakis, Simulation models for rarefied flow past a sphere in a pipe", Proc. 21st Symposium on Rarefied Gas Dynamics, France, 1998.

64. X. Ma* and G.E. Karniadakis, "The spectrum of the turbulent near-wake: A comparison of DNS and LES", 1st AFOSR Int. Conference on DNS/LES, Ruston, LA, 1997 (invited paper).

65. A. Beskok* and G.E. Karniadakis, "Modeling separation in rarefied gas flows", AIAA 97-1783, 4th AIAA Shear Flow Conference, Snowmass Village, CO, 1997.

66. I. Lomtev* and G.E. Karniadakis, "A discontinuous spectral/hp element Galerkin method for the Navier-Stokes equations on unstructured grids", Proc. IMACS WC'97, Berlin, Germany, 1997.

67. I. Lomtev* and G.E. Karniadakis, "Simulations of viscous supersonic flows on unstructured h-p meshes", AIAA 97- 0754, 35th Aerospace Sciences Meeting, Reno, 1997.

68. X. Ma* and G.E. Karniadakis, "Three-dimensional modeling of unsteady heat transfer", FEDSM97-3658, ASME Fluids Engineering Division Summer Meeting, Vancouver, 1997.

69. T.C. Warburton* and G.E. Karniadakis, "Spectral simulations of flow past a cylinder close to a free surface", FEDSM973689, ASME Fluids Engineering Division Summer Meeting, Vancouver, 1997.

70. C. Evangelinos* and G.E. Karniadakis, "Transition in the wake of flexible cables and beams", 7th ISOPE Conference, Honolulu, Hawaii, 1997.

71. S.J. Sherwin, C. Evangelinos*, H. Tufo and G.E. Karniadakis, "Development of a parallel unstructured spectral/hp method for unsteady fluid dynamics", Proc. Parallel CFD'97, May 1997.

72. D.J. Newman* and G.E. Karniadakis, "Low-dimensional modeling of flow-induced vibrations via proper orthogonal decomposition," 21st Symposium on Naval Hydrodynamics, Norway, 1996.

73. C.H. Crawford* and G.E. Karniadakis, "Reynolds stress analysis of controlled wall-bounded turbulence," AIAA 96- 2008, 27th AIAA Fluid Dynamics Conference, June 17-20, 1996, New Orleans, LA (invited presentation).

74. C. Evangelinos* and G.E. Karniadakis, "Communication patterns and models in PRISM: A spectral element- Fourier parallel Navier-Stokes solver", Proc. Supercomputing'96, Pittsburgh, Nov. 17-22, 1996 (finalist for best student paper).

75. D.J. Newman* and G.E. Karniadakis, " Direct numerical simulations of flow over a flexible cable," Sixth Int. Conf. on Flow-Induced Vibrations, Imperial College, April 10-12, 1995, editor P.W. Bearman, Balkema.

76. D.J. Newman* and G.E. Karniadakis, "Simulations and models of flow over a flexible cable: Standing wave patterns," ASME/JSME Fluids Engineering Conference, August 1995, Hilton Head SC.

77. D.J. Newman* and G.E. Karniadakis, "Simulations of flow over a flexible cable: Responses and flow patterns," AIAA 95-1744, 12th AIAA CFD Conference, June 19-22, 1995, San Diego, CA.

78. C.H. Crawford* and G.E. Karniadakis, "Control of unsteady flows via electro-magnetic fields," AIAA 95-2185, 26th AIAA Fluid Dynamics Conference, June 19-22, 1995, San Diego, CA.

79. A. Beskok*, W. Trimmer, and G.E. Karniadakis, "Rarefaction, compressibility and thermal creep effects for gas microflows," ASME Annual Winter Meeting, November 1995, San Francisco, CA.

80. S.J. Sherwin* and G.E. Karniadakis, "Triangular and tetrahedral spectral elements," ICOSA-HOM'95, June 5-9, 1995, Houston, TX.

81. T.C. Warburton*, S.J. Sherwin* and G.E. Karniadakis, "Unstructured hp/spectral elements: Connectivity and optimal ordering," Int. Conf. on Comp. Engin. Science, July 30-August 3, 1995, Mauna Lani, Hawaii.

82. T.C. Warburton*, S.J. Sherwin* and G.E. Karniadakis, "Hierarchical refinement using spectral/hp triangles and prisms," Sixth Int. Symp. on CFD, September 4-8, 1995, Lake Taho, Nevada.

83. S.J. Sherwin* and G.E. Karniadakis, "Adaptive hp finite elements on unstructured meshes," IX Int. Conf. on Finite Elements in Fluids: New Trends and Applications, October 15-21, 1995, Venice, Italy.

84. S.J. Sherwin* and G.E. Karniadakis, "Tetrahedral spectral elements for CFD," Proc. 14th Int. Conf. Num. Meth. Fluid Dynamics, July 11-15, 1994, Bangalore, India.

85. S.J. Sherwin* and G.E. Karniadakis, "A triangular spectral element method: Algorithms and flow applications," Computational Fluid Dynamics '94, p. 62, John Wiley Sons, 1994.

86. R.D. Henderson*, C.H. Crawford* G.E. Karniadakis, "Structure and statistics of turbulent flow over riblets," AIAA93-0548, 31st Aerospace Meeting, Reno, 1993.

87. A.G. Tomboulides*, S.A. Orszag G.E. Karniadakis, "Direct and large eddy simulation of axisymmetric wakes," AIAA-93-0546, 31st Aerospace Meeting, Reno, 1993.

88. P.F. Batcho* G.E. Karniadakis, "Global spectral methods for the solution of incompressible Navier-Stokes equations in complex geometries," Proc. 5th Int. Symp. on CFD, Sendai, Japan, 1993.

89. J. Trujillo* G.E. Karniadakis, "A spectral element velocity-vorticity algorithm for the incompressible Navier- Stokes equations," Proc. 5th Int. Symp. on CFD, Sendai Japan, 1993.

90. R.D. Henderson* and G.E. Karniadakis, "Unstructured spectral element methods for the incompressible Navier- Stokes equations," in Proc. Finite Elements in Fluids: New Trends and Applications," eds. K.Morgan, E. Onate, J. Periaux, J. Peraire and O.C. Zienkewicz, Pineridge Press, 1993.

91. A. Beskok* and G.E. Karniadakis, "Simulation of heat and momentum transfer in complex microgeometries," AIAA 93-3269, 1st Shear Flow Conference, Orlando, 1993.

92. H.M. Blackburn and G.E. Karniadakis, "Two-and three-dimensional simulations of vortex-induced vibration of a circular cylinder," Proc. 3rd ISOPE-93 Conf., vol. 3, p. 715, Singapore, 1993.

93. J. Giannakouros*, D. Sidilkover G.E. Karniadakis, "Hybrid spectral element methods for hyperbolic systems of conservation laws," Proc. Fourth Int. Conf. on Hyperb. Problems, Taormina, Italy, April 1992.

94. S.J. Sherwin*, E. Barough, S.A. Orszag G.E. Karniadakis, "Application of an ENO scheme to simulate the ion etching process," Proc. Fourth Int. Conf. on Hyperb. Problems, Taormina, Italy, April 1992.

95. C.H. Crawford*, D. Chu* G.E. Karniadakis, "Laminar and turbulent flow over optimal riblets," Proc. First European Conference on CFD, Brussels, 1992, vol. 1, p. 191, ed. C. Hirsch, J. Perriaux

W. Kordulla, Elsevier.

96. M.V. Zagarola, A.J. Smits G.E. Karniadakis, "Heat transfer enhancement in transitional channel flow," Proc. Second Int. Coll. on Bluff Body Aerodynamics and Applications, Melbourne, 1992.

97. A. Beskok* G.E. Karniadakis, "Simulation of slip-flows in complex micro-geometries," Proc. ASME, Winter Annual Meeting, Anaheim, CA, 1992.

98. G.E. Karniadakis, S.A. Orszag V. Yakhot, "RNG simulations of transitional and turbulent flow over a backward- facing step," (invited), Proc. on Large-Eddy Simulation: Where Do We Stand?, St. Petersburg, FL, 1991, also in Large Eddy Simulation of Complex Engineering and Geophysical Flows, p. 159, eds. B. Galperin S.A. Orszag, Cambridge University Press, 1993.

99. D. Chu* G.E. Karniadakis, "Numerical investigation of drag reduction in flow over surfaces with streamwise aligned riblets," AIAA-91-0518, 29th Aerospace Sciences Meeting, Reno, 1991.

100. A.G. Tomboulides*, S.A. Orszag G.E. Karniadakis, "Three-dimensional simulation of flow past a sphere," Proc. 1st ISOPE-91 Conf., Edinburgh, 1991.

101. R.D. Henderson* G.E. Karniadakis, "Hybrid spectral element methods for flows over rough walls," Proc. 5th Conf. on Domain Decomposition Methods, SIAM, 1991.

102. D. Sidilkover, J. Giannakouros* G.E. Karniadakis, "Hybrid spectral element methods for hyperbolic conservation laws," Proc. Ninth GAMM Conf. on Num. Meth. in Fluid Mech., Vieweg Verlag, 1991.

103. D. Chu*, R.D. Henderson* G.E. Karniadakis, "Parallel hybrid spectral element methods for incompressible flows," Proc. 4th Int. Conf. on CFD, Davis, 1991.

104. G.S. Triantafyllou G.E. Karniadakis, "The route to chaos in the wake of bluff object," in Research Trends in Physics: Chaotic Dynamics and Transport in Fluids and Plasmas, Ed. I. Prigogine et al., AIP, 1991.

105. G.S. Triantafyllou G.E. Karniadakis, "The route to turbulence in nominally two-dimensional free shear flows," Proc. 8th Symp. on Turb. Shear Flows, Munich, 1991.

106. D. Pathria G.E. Karniadakis, "Dynamic generation of spectral element meshes through wavelet analysis," USA-French Workshop on Wavelets and Turbulence, Princeton, 1991, (unpublished).

107. G.E. Karniadakis, "Three-dimensional equilibria and transition in complex geometry flows," Proc. 1st IMACS Int. Conf. on Comp. Phys., 1990, (invited).

108. G.E. Karniadakis G.S. Triantafyllou, "Direct numerical simulation of the three-dimensional vortex street," AIAA90-0113, 28th Aerospace Sciences Meeting, Reno, 1990.

109. A.G. Tomboulides*, S.A. Orszag G.E. Karniadakis, "Three-dimensional simulation of flow past a sphere," U.S. Nat'l Congress on Theor. Appl. Mech., Tucson, AZ, 1990, (invited).

110. G.E. Karniadakis S.A. Orszag, "Spectral simulations of complex flows," Proc. 5th Int. Conf. on Sciences and Engineering on Supercomputers, London, 1990, (invited).

111. E. Barough, B. Bradie, U. Hollerbach, G.E. Karniadakis S.A. Orszag, "Comprehensive 3-D notching simulator with non-planar substrates," Proc. on Optical/Laser Microlithography, vol. 3, p. 334, SPIE, 1990.

112. G.E. Karniadakis, A. Yakhot , S.A. Orszag V. Yakhot, "Spectral element-RNG simulations of turbulent heat transfer in complex geometries," Proc. 9th Int. Heat Transfer Conf., vol. 3, p. 247, 1990.

113. G.E. Karniadakis, S.A. Orszag V. Yakhot, "Large eddy/RNG simulation of flow over a backward-facing step," in Engineering Turbulence: Modeling and Experiments, Elsevier, p. 269, 1990.

114. C. Berman, J. Ramos, G.E. Karniadakis S.A. Orszag, "Time-dependent jet flow and noise computations," AIAA-903961, 13th Aero-acoustics Conf., Tallahassee, 1990.

115. G.E. Karniadakis, A. Yakhot, S. Rakib, S. Orszag V. Yakhot, "Spectral element-RNG simulation of turbulent flows in complex geometries," Proc. 7th Symp. on Turb. Shear Flows, Stanford, 1989.

116. C. Mavriplis, P. Fischer G.E. Karniadakis. "Direct numerical simulation of the impulsive flow past a wedge- like corner," Proc. 10th Austr. Fluid Mech. Conf., vol. II, 1989.

117. G.S. Triantafyllou G.E. Karniadakis, "Forces on a vibrating cylinder in steady cross-flow," Proc. 8th OMAE (Offshore Mech Arctic Eng.) Conf., Hague, 1989.

118. C. Begue, C. Bernardi, N. Debit, Y. Maday, G.E. Karniadakis A.T. Patera, "Nonconforming spectral element- finite element approximations for the Navier-Stokes equations," Proc. 8th Int. Conf. on Comp. Methods in Applied Science and Engineering, Versaille, 1987, also in C.M.A.M.E., vol. 75, p. 109, 1989.

119. G.E. Karniadakis, S.A. Orszag, A. Yakhot and V. Yakhot, "RNG modeling techniques for complex turbulent flows," Proc. 5th Int. Conf. on Num. Ship Hydrodynamics, Hiroshima, 1989, (invited).

120. Y. Maday, A.T. Patera G.E. Karniadakis, "Spectral and finite element approximation for the unsteady incompressible Euler equations," Notes aux Reudus de l'Academie des Sciences, Paris, 1987, (invited).

121. G.E. Karniadakis C. Amon, "Stability calculations of wall bounded flows in complex geometries," Proc. 6th IMACS Symp. on P.D.E.s, p. 525, 1987, (invited).

122. G.E. Karniadakis, B.B. Mikic A.T. Patera, "Heat transfer enhancement by flow destabilization: Application to the cooling of chips," Int. Symp. on Cooling Technology for Electronic Equipment, Hemisphere, p. 587, 1987.

123. M. Greiner, G.E. Karniadakis, B.B. Mikic A.T. Patera, "Heat transfer augmentation and hydrodynamic stability theory: Understanding and exploitation," Proc. Heat Transfer Conf., Korea, 1986.

124. E.T. Bullister, G.E. Karniadakis, E.M. Ronquist A.T. Patera, "Solutions of the unsteady Navier-Stokes equations by spectral element methods," Proc. 6th Int. Symp. on Finite Element Methods in Flow Problems, Antibes, 1986.

125. G.E. Karniadakis, B.B. Mikic A.T. Patera, "Unsteady heat transfer from a cylinder in crossflow: A direct numerical simulation," Proc. 8th Int. Heat Transfer Conf., vol. 2, p. 429, 1986.

126. G.E. Karniadakis, E.T. Bullister, B.B. Mikic A.T. Patera, "A spectral element method applied to the cooling of electronic components," Proc. AIAA/ASME Thermod. and Heat Transfer Conf., Boston, 1986.

127. G.E. Karniadakis A.T. Patera, "A spectral element method for the simulation of unsteady incompressible flows with heat transfer," Proc. 4th Int. Symp. on Num. Meth. in Eng., Springer, p. 231, 1986.

128. G.E. Karniadakis, E.T. Bullister A.T. Patera, "A spectral element method for solution of two-and three- dimensional time-dependent incompressible Navier-Stokes equations," Proc. Europe-U.S. Conf. on Finite Element Methods for Nonlinear Problems, Springer-Verlag, p. 803, 1985.