



Parviz Moin

Franklin P. and Caroline M. Johnson Professor in the School of Engineering
Mechanical Engineering

CONTACT INFORMATION

• Administrative Contact

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Administration

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Bio

BIO

Moin is the founding director of the Center for Turbulence Research. Established in 1987 as a research consortium between NASA and Stanford, Center for Turbulence Research is devoted to fundamental studies of turbulent flows. Center of Turbulence Research is widely recognized as the international focal point for turbulence research, attracting diverse groups of researchers from engineering, mathematics and physics. He was the founding director of the Institute for Computational and Mathematical Engineering at Stanford.

Professor Moin pioneered the use of direct and Large Eddy Simulation techniques for the study of turbulence physics, control and modelling concepts and has written widely on the structure of turbulent shear flows. His current interests include: Computational physics, Physics and control of turbulent boundary layers, hypersonic flows, propulsion, flow control, large eddy simulation for aerospace applications and aircraft icing.

ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Member, Institute for Computational and Mathematical Engineering (ICME)

ADMINISTRATIVE APPOINTMENTS

- Founding Director, Institute for Computational and Mathematical Engineering, Stanford, (2003-2005)
- Chair, American Physical Society, Fluid Dynamics Division, (2000-2001)
- Chair, Engineering Sciences Section, National Academy of Sciences, (2014-2017)

HONORS AND AWARDS

- Member, National Academy of Sciences (2011-)
- Member, National Academy of Engineering (1997-)
- Member, American Academy of Arts and Sciences (2009)
- Corresponding Member, Royal Spanish Academy of Engineering (2014-)

- Fellow, American Physical Society (APS) (1992)
- Fellow, American Institute of Aeronautics and Astronautics (AIAA) (2009)
- Fluid Dynamics Prize, American Physical Society (APS) (1996)
- Fluid Dynamics Award, American Institute of Aeronautics and Astronautics (AIAA) (2009)
- Highly Cited Researcher, ISI-Original list
- Einstein Professorship, Chinese Academy of Sciences (2009)
- Moody Award, American Society of Mechanical Engineers (ASME) (2006)
- Outstanding Leadership Medal, The National Aeronautics and Space Administration (NASA) (2002)
- Outstanding Achievement Award, University of Minnesota (2008)
- Doctores Honoris Causa, Universidad Politecnica de Madrid (1998)
- Alexander von Humboldt Prize, Federal Republic of Germany (1995)
- Lawrence Sperry Award, American Institute of Aeronautics and Astronautics (AIAA) (1986)
- Exceptional Scientific Achievement Medal, The National Aeronautics and Space Administration (NASA) (1985)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Committee on Foundational Research Gaps and Future Directions for Digital Twins, National Academy of Sciences, Engineering and Medicine (2022 - 2023)
- Editorial Advisory Board, Flow (2021 - present)
- Member, Space Nuclear Propulsion Committee, National Academy of Sciences, Engineering and Medicine (2020 - 2021)
- Co-Chair, Visiting Committee, Division of Engineering and Applied Science, California Institute of Technology (2019 - 2019)
- Member, Committee on Advanced Technologies for Gas Turbines, National Academies of Sciences, Engineering and Medicine (2018 - 2019)
- Panel on Review of Laboratory Research at the Army's Research Development, and Engineering Centers, National Academies of Sciences, Engineering and Medicine (2018 - 2019)
- Member, Aeronautics and Space Engineering Board, National Academies of Sciences, Engineering and Medicine (2017 - 2023)
- Editorial Board, Physical Review Fluids (2015 - 2021)
- Panel on Improving the Air Force Scientific Discovery Mission, National Academies, Air Force Studies Board (2015 - 2015)
- Chair, National Academy of Sciences, Engineering Sciences Section (2014 - 2017)
- Member, Visiting Committee, Division of Engineering and Applied Science, California Institute of Technology (2014 - 2014)
- Member, Committee on Membership, National Academy of Sciences (2013 - 2016)
- Member, International Temporary Nominating Committee, National Academy of Sciences (2013 - 2015)
- Panel on Mechanical Science and Engineering at the Army Research Laboratory, National Academy of Sciences (2013 - 2014)
- Mechanical Engineering Peer Committee, National Academy of Engineering (2010 - 2012)
- Consultant, Naval Research Advisory Committee (NRAC) (2009 - 2009)
- Editor, Annual Review of Fluid Mechanics (2002 - 2023)
- Editorial Board, Flow, Turbulence and Combustion (2000 - 2015)
- Chair, Division of Fluid Dynamics, American Physical Society (2000 - 2001)
- Associate Editor, Physics of Fluids (1999 - 2015)
- Member, United States National Committee on Theoretical and Applied Mechanics (1999 - 2003)
- Associate Editor, Journal of Computational Physics (1998 - present)
- Vice Chair, Division of Fluid Dynamics, American Physical Society (1998 - 1999)
- Executive Committee, Division of Fluid Dynamics, American Physical Society (1993 - 1996)

PROFESSIONAL EDUCATION

- B.S., University of Minnesota , Mechanical Engineering (with High Distinction) (1974)
- M.S., Stanford University , Mechanical Engineering (1975)
- M.S., Stanford University , Mathematics (1978)
- Ph.D., Stanford University , Mechanical Engineering (with Great Distinction) (1978)

LINKS

- Center for Turbulence Research: <http://ctr.stanford.edu>
- CTR Current Staff and Postdoctoral Fellows: <http://ctr.stanford.edu/current>
- CTR Former Postdoctoral Fellows, Staff, and Visiting Scholars: <http://ctr.stanford.edu/former>
- Flow Physics and Computational Engineering: <https://web.stanford.edu/group/fpc/cgi-bin/fpcwiki/>

Teaching

COURSES

2022-23

- Linear Algebra with Application to Engineering Computations: CME 200, ME 300A (Aut)
- Spectral Methods in Computational Physics: CME 322, ME 408 (Win)

2021-22

- Linear Algebra with Application to Engineering Computations: CME 200, ME 300A (Aut)
- Turbulence: ME 361 (Spr)
- Turbulence Physics and Modeling Using Numerical Simulation Data: ME 406 (Sum)

2020-21

- Spectral Methods in Computational Physics: CME 322, ME 408 (Win)
- Turbulence: ME 361 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Kevin Cherng, Ryan Hass, Nguyen Ly, Hang Song

Postdoctoral Faculty Sponsor

Davy Brouzet, Salvador Gomez, Hanul Hwang, Charlelie Laurent, Jianyu Wang, Federico Zabaleta, Tony Zahtila

Doctoral Dissertation Advisor (AC)

Rahul Agrawal, Brett Bornhoft, Lucy Brown, Ahmed Elnahas, Tim Flint, Carlos Gonzalez, Michael Whitmore, Christopher Williams

Doctoral Dissertation Co-Advisor (AC)

Arun Balakrishna

Master's Program Advisor

Jiawen Bao

Doctoral (Program)

Ahmed Elnahas, Tim Flint

Publications

PUBLICATIONS

- **Large-eddy simulations of the NACA23012 airfoil with laser-scanned ice shapes** *AEROSPACE SCIENCE AND TECHNOLOGY*
Bornhoft, B., Jain, S. S., Goc, K., Bose, S. T., Moin, P.
2024; 146
- **Stable, entropy-consistent, and localized artificial-diffusivity method for capturing discontinuities** *Physical Review Fluids*
Jain, S. S., Agrawal, R., Moin, P.
2024
- **Wind Tunnel and Grid Resolution Effects in Large-Eddy Simulation of the High-Lift Common Research Model** *JOURNAL OF AIRCRAFT*
Goc, K. A., Moin, P., Bose, S. T., Clark, A. M.
2023
- **Near-wall model for compressible turbulent boundary layers based on an inverse velocity transformation** *JOURNAL OF FLUID MECHANICS*
Griffin, K. P., Fu, L., Moin, P.
2023; 970
- **Assessment of diffuse-interface methods for compressible multiphase fluid flows and elastic-plastic deformation in solids** *JOURNAL OF COMPUTATIONAL PHYSICS*
Jain, S. S., Adler, M. C., West, J. R., Mani, A., Moin, P., Lele, S. K.
2023; 475
- **Introduction** *ANNUAL REVIEW OF FLUID MECHANICS*
Stone, H. A., Moin, P.
2023; 55: V
- **Atomization of the optimally disturbed liquid jets** *PHYSICAL REVIEW FLUIDS*
Hwang, H., Kim, D., Moin, P.
2022; 7 (11)
- **A kinetic energy-and entropy-preserving scheme for compressible two-phase flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
Jain, S. S., Moin, P.
2022; 464
- **Non-Boussinesq subgrid-scale model with dynamic tensorial coefficients** *PHYSICAL REVIEW FLUIDS*
Agrawal, R., Whitmore, M. P., Griffin, K. P., Bose, S. T., Moin, P.
2022; 7 (7)
- **Performance of Wall-Modeled LES with Boundary-Layer-Conforming Grids for External Aerodynamics** *AIAA JOURNAL*
Lozano-Duran, A., Bose, S. T., Moin, P.
2021
- **Prediction of aerothermal characteristics of a generic hypersonic inlet flow** *THEORETICAL AND COMPUTATIONAL FLUID DYNAMICS*
Fu, L., Bose, S., Moin, P.
2021
- **Velocity transformation for compressible wall-bounded turbulent flows with and without heat transfer** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Griffin, K., Fu, L., Moin, P.
2021; 118 (34)
- **Wall-Modeled Large-Eddy Simulation of Turbulent Boundary Layers with Mean-Flow Three-Dimensionality** *AIAA JOURNAL*
Cho, M., Lozano-Duran, A., Moin, P., Park, G.
2021; 59 (5): 1707-1717
- **The turbulent bubble break-up cascade. Part 2. Numerical simulations of breaking waves** *JOURNAL OF FLUID MECHANICS*
Chan, W., Johnson, P. L., Moin, P., Urzay, J.

2021; 912

- **The turbulent bubble break-up cascade. Part 1. Theoretical developments** *JOURNAL OF FLUID MECHANICS*
Chan, W., Johnson, P. L., Moin, P.
2021; 912
- **A mechanism for the amplification of interface distortions on liquid jets** *JOURNAL OF FLUID MECHANICS*
Hwang, H., Moin, P., Hack, M.
2021; 911
- **General method for determining the boundary layer thickness in nonequilibrium flows** *Physical Review Fluids*
Griffin, K., Fu, L., Moin, P.
2021; 6: 024608
- **Large eddy simulation of aircraft at affordable cost: a milestone in computational fluid dynamics** *FLOW*
Goc, K. A., Lehmkuhl, O., Park, G. I., Bose, S. T., Moin, P.
2021; 1: 1-21
- **Identifying and tracking bubbles and drops in simulations: A toolbox for obtaining sizes, lineages, and breakup and coalescence statistics** *Journal of Computational Physics*
Chan, W. R., Dodd, M. S., Johnson, P. L., Moin, P.
2021; 432: 22
- **Shock-induced heating and transition to turbulence in a hypersonic boundary layer** *Journal of Fluid Mechanics*
Fu, L., Karp, M., Bose, S., Moin, P., Urzay, J.
2021; 909: A8
- **Laminar to fully turbulent flow in a pipe: scalar patches, structural duality of turbulent spots and transitional overshoot** *JOURNAL OF FLUID MECHANICS*
Wu, X., Moin, P., Adrian, R. J.
2020; 896
- **Subgrid-scale Capillary Breakup Model for Liquid Jet Atomization** *COMBUSTION SCIENCE AND TECHNOLOGY*
Kim, D., Moin, P.
2020
- **Turbophoresis of small inertial particles: theoretical considerations and application to wall-modelled large-eddy asimulations** *JOURNAL OF FLUID MECHANICS*
Johnson, P. L., Bassenne, M., Moin, P.
2020; 883
- **Non-equilibrium three-dimensional boundary layers at moderate Reynolds numbers** *JOURNAL OF FLUID MECHANICS*
Lozano-Duran, A., Giometto, M. G., Park, G., Moin, P.
2020; 883
- **A conservative diffuse-interface method for compressible two-phase flows** *Journal of Computational Physics*
Jain, S. S., Mani, A., Moin, P.
2020; 418
- **Wall-modeled large-eddy simulation of non-equilibrium turbulent boundary layers** *arXiv preprint arXiv:2001.01020*
Cho, M., Park, G., Lozano-Durán, A., Moin, P.
2020: 1-14
- **Birth of microbubbles in turbulent breaking waves**
Chan, W., Mirjalili, S., Jain, S. S., Urzay, J., Mani, A., Moin, P.
AMER PHYSICAL SOC.2019
- **A dynamic spectrally enriched subgrid-scale model for preferential concentration in particle-laden turbulence** *INTERNATIONAL JOURNAL OF MULTIPHASE FLOW*
Bassenne, M., Esmaily, M., Livescu, D., Moin, P., Urzay, J.
2019; 116: 270–80

- **Dynamic slip wall model for large-eddy simulation.** *Journal of fluid mechanics*
Bae, H. J., Lozano-Durán, A., Bose, S. T., Moin, P.
2019; 859: 400-432
- **Dynamic slip wall model for large-eddy simulation** *JOURNAL OF FLUID MECHANICS*
Bae, H., Lozano-Duran, A., Bose, S. T., Moin, P.
2018; 859: 400-432
- **Wavelet multiresolution analysis of particle-laden turbulence** *PHYSICAL REVIEW FLUIDS*
Bassenne, M., Moin, P., Urzay, J.
2018; 3 (8)
- **Coherent instability in wall-bounded shear** *JOURNAL OF FLUID MECHANICS*
Hack, M., Moin, P.
2018; 844: 917-55
- **Annual Review of Fluid Mechanics Introduction** *ANNUAL REVIEW OF FLUID MECHANICS, VOL 50*
Davis, S. H., Moin, P., Davis, S. H., Moin, P.
2018; 50: V-VI
- **Conservative and bounded volume-of-fluid advection on unstructured grids** *JOURNAL OF COMPUTATIONAL PHYSICS*
Ivey, C. B., Moin, P.
2017; 350: 387-419
- **Large-Eddy Simulation of Thermally Stratified Atmospheric Boundary-Layer Flow Using a Minimum Dissipation Model.** *Boundary-layer meteorology*
Abkar, M., Moin, P.
2017; 165 (3): 405-419
- **Large-Eddy Simulation of Thermally Stratified Atmospheric Boundary-Layer Flow Using a Minimum Dissipation Model** *BOUNDARY-LAYER METEOROLOGY*
Abkar, M., Moin, P.
2017; 165 (3): 405-19
- **Log-layer mismatch and modeling of the fluctuating wall stress in wall-modeled large-eddy simulations.** *Physical review fluids*
Yang, X. I., Park, G. I., Moin, P.
2017; 2 (10)
- **Large-Eddy Simulation-Based Characterization of Suction and Oscillatory Blowing Fluidic Actuator** *AIAA JOURNAL*
Kim, J., Moin, P., Seifert, A.
2017; 55 (8): 2566-79
- **Transitional-turbulent spots and turbulent-turbulent spots in boundary layers** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Wu, X., Moin, P., Wallace, J. M., Skarda, J., Lozano-Duran, A., Hickey, J.
2017; 114 (27): E5292-E5299
- **An Appreciation of the Life and Work of William C. Reynolds (1933-2004)** *ANNUAL REVIEW OF FLUID MECHANICS, VOL 49*
Moin, P., Homsy, G. M.
2017; 49: 1-21
- **Minimum-dissipation scalar transport model for large-eddy simulation of turbulent flows** *PHYSICAL REVIEW FLUIDS*
Abkar, M., Bae, H. J., Moin, P.
2016; 1 (4)
- **Space-time characteristics of wall-pressure and wall shear-stress fluctuations in wall-modeled large eddy simulation** *PHYSICAL REVIEW FLUIDS*
Park, G. I., Moin, P.
2016; 1 (2)
- **Direct numerical simulation of a turbulent hydraulic jump: turbulence statistics and air entrainment** *JOURNAL OF FLUID MECHANICS*
Mortazavi, M., Le Chenadec, V., Moin, P., Mani, A.

2016; 797: 60-94

- **Space-time characteristics of wall-pressure and wall shear-stress fluctuations in wall-modeled large eddy simulation.** *Physical review fluids*
Park, G. I., Moin, P.
2016; 1 (2)
- **Constant-energetics physical-space forcing methods for improved convergence to homogeneous-isotropic turbulence with application to particle-laden flows** *PHYSICS OF FLUIDS*
Bassenne, M., Urzay, J., Park, G. I., Moin, P.
2016; 28 (3)
- **Numerical aspects and implementation of a two-layer zonal wall model for LES of compressible turbulent flows on unstructured meshes** *JOURNAL OF COMPUTATIONAL PHYSICS*
Park, G. I., Moin, P.
2016; 305: 589-603
- **On the suitability of second-order accurate discretizations for turbulent flow simulations** *EUROPEAN JOURNAL OF MECHANICS B-FLUIDS*
Moin, P., Verzicco, R.
2016; 55: 242-245
- **Accurate interface normal and curvature estimates on three-dimensional unstructured non-convex polyhedral meshes** *JOURNAL OF COMPUTATIONAL PHYSICS*
Ivey, C. B., Moin, P.
2015; 300: 365-386
- **Minimum-dissipation models for large-eddy simulation** *PHYSICS OF FLUIDS*
Rozema, W., Bae, H. J., Moin, P., Verstappen, R.
2015; 27 (8)
- **Osborne Reynolds pipe flow: Direct simulation from laminar through gradual transition to fully developed turbulence** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Wu, X., Moin, P., Adrian, R. J., Baltzer, J. R.
2015; 112 (26): 7920-7924
- **Reduced-order representation of near-wall structures in the late transitional boundary layer** *JOURNAL OF FLUID MECHANICS*
Sayadi, T., Schmid, P. J., Nichols, J. W., Moin, P.
2014; 748: 278-301
- **Subgrid-scale backscatter in reacting and inert supersonic hydrogen-air turbulent mixing layers** *JOURNAL OF FLUID MECHANICS*
O'Brien, J., Urzay, J., Ihme, M., Moin, P., Saghafian, A.
2014; 743: 554-584
- **An improved dynamic non-equilibrium wall-model for large eddy simulation** *PHYSICS OF FLUIDS*
Park, G. I., Moin, P.
2014; 26 (1)
- **A dynamic slip boundary condition for wall-modeled large-eddy simulation** *PHYSICS OF FLUIDS*
Bose, S. T., Moin, P.
2014; 26 (1)
- **Direct numerical simulation of complete H-type and K-type transitions with implications for the dynamics of turbulent boundary layers** *JOURNAL OF FLUID MECHANICS*
Sayadi, T., Hamman, C. W., Moin, P.
2013; 724: 480-509
- **Application of vortex identification schemes to direct numerical simulation data of a transitional boundary layer** *PHYSICS OF FLUIDS*
Pierce, B., Moin, P., Sayadi, T.
2013; 25 (1)
- **On the use of the Ffowcs Williams-Hawkings equation to predict far-field jet noise from large-eddy simulations** *INTERNATIONAL JOURNAL OF AEROACOUSTICS*

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- Mendez, S., Shoeybi, M., Lele, S. K., Moin, P.
2013; 12 (1-2): 1-20
- **Large eddy simulation of controlled transition to turbulence** *PHYSICS OF FLUIDS*
Sayadi, T., Moin, P.
2012; 24 (11)
 - **Fundamental and subharmonic transition to turbulence in zero-pressure-gradient flat-plate boundary layers** *PHYSICS OF FLUIDS*
Sayadi, T., Hamman, C. W., Moin, P.
2012; 24 (9)
 - **Verification of variable-density flow solvers using manufactured solutions** *JOURNAL OF COMPUTATIONAL PHYSICS*
Shunn, L., Ham, F., Moin, P.
2012; 231 (9): 3801-3827
 - **Large-Eddy Simulations of Perfectly Expanded Supersonic Jets Using an Unstructured Solver** *48th AIAA Aerospace Sciences Meeting*
Mendez, S., Shoeybi, M., Sharma, A., Ham, F. E., Lele, S. K., Moin, P.
AMER INST AERONAUTICS ASTRONAUTICS.2012: 1103–18
 - **Boundary layer turbulence in transitional and developed states** *PHYSICS OF FLUIDS*
Park, G. I., Wallace, J. M., Wu, X., Moin, P.
2012; 24 (3)
 - **Grid-point requirements for large eddy simulation: Chapman's estimates revisited** *PHYSICS OF FLUIDS*
Choi, H., Moin, P.
2012; 24 (1)
 - **NOISE PREDICTION OF PRESSURE-MISMATCHED JETS USING UNSTRUCTURED LARGE EDDY SIMULATION** *ASME Turbo Expo 2011*
Khalighi, Y., Ham, F., Moin, P., Lele, S. K., Schlinker, R. H.
AMER SOC MECHANICAL ENGINEERS.2011: 381–387
 - **Grid-independent large-eddy simulation using explicit filtering** *PHYSICS OF FLUIDS*
Bose, S. T., Moin, P., You, D.
2010; 22 (10)
 - **A high order multivariate approximation scheme for scattered data sets** *JOURNAL OF COMPUTATIONAL PHYSICS*
Wang, Q., Moin, P., Laccarino, G.
2010; 229 (18): 6343-6361
 - **An adaptive implicit-explicit scheme for the DNS and LES of compressible flows on unstructured grids** *JOURNAL OF COMPUTATIONAL PHYSICS*
Shoeybi, M., Svaerd, M., Ham, F. E., Moin, P.
2010; 229 (17): 5944-5965
 - **Transitional and turbulent boundary layer with heat transfer** *PHYSICS OF FLUIDS*
Wu, X., Moin, P.
2010; 22 (8)
 - **Large-activation-energy theory for premixed combustion under the influence of enthalpy fluctuations** *JOURNAL OF FLUID MECHANICS*
Wu, X., Moin, P.
2010; 655: 3-37
 - **Assessment of high-resolution methods for numerical simulations of compressible turbulence with shock waves** *JOURNAL OF COMPUTATIONAL PHYSICS*
Johnsen, E., Larsson, J., Bhagatwala, A. V., Cabot, W. H., Moin, P., Olson, B. J., Rawat, P. S., Shankar, S. K., Sjoegreen, B., Yee, H. C., Zhong, X., Lele, S. K.
2010; 229 (4): 1213-1237
 - **Prediction of Sound Generated by Complex Flows at Low Mach Numbers** *AIAA JOURNAL*
Khalighi, Y., Mani, A., Ham, F., Moin, P.
2010; 48 (2): 306-316

- **A RATIONAL INTERPOLATION SCHEME WITH SUPERPOLYNOMIAL RATE OF CONVERGENCE** *SIAM JOURNAL ON NUMERICAL ANALYSIS*
Wang, Q., Moin, P., Iaccarino, G.
2010; 47 (6): 4073-4097
- **Sources of high-speed jet noise: analysis of LES data and modeling** *IUTAM Symposium on Computational Aero-Acoustics for Aircraft Noise Prediction*
Lele, S. K., Mendez, S., Ryu, J., Nichols, J., Shoeybi, M., Moin, P.
ELSEVIER SCIENCE BV.2010: 84–93
- **UNSTRUCTURED LARGE EDDY SIMULATION TECHNOLOGY FOR PREDICTION AND CONTROL OF JET NOISE** *ASME Turbo Expo 2010*
Khalighi, Y., Ham, F., Moin, P., Lele, S. K., Colonius, T., Schlinker, R. H., Reba, R. A., Simonich, J.
AMER SOC MECHANICAL ENGINEERS.2010: 57–70
- **Revisiting Taylor's hypothesis** *JOURNAL OF FLUID MECHANICS*
Moin, P.
2009; 640: 1-4
- **Suitability of artificial bulk viscosity for large-eddy simulation of turbulent flows with shocks** *JOURNAL OF COMPUTATIONAL PHYSICS*
Mani, A., Larsson, J., Moin, P.
2009; 228 (19): 7368-7374
- **Prediction of wall-pressure fluctuation in turbulent flows with an immersed boundary method** *JOURNAL OF COMPUTATIONAL PHYSICS*
Kang, S., Iaccarino, G., Ham, F., Moin, P.
2009; 228 (18): 6753-6772
- **Forest of hairpins in a low-Reynolds-number zero-pressure-gradient flat-plate boundary layer** *PHYSICS OF FLUIDS*
Wu, X., Moin, P.
2009; 21 (9)
- **Direct numerical simulation of turbulence in a nominally zero-pressure-gradient flat-plate boundary layer** *JOURNAL OF FLUID MECHANICS*
Wu, X., Moin, P.
2009; 630: 5-41
- **Accurate Immersed-Boundary Reconstructions for Viscous Flow Simulations** *AIAA JOURNAL*
Kang, S., Iaccarino, G., Moin, P.
2009; 47 (7): 1750-1760
- **Computational study of optical distortions by separated shear layers and turbulent wakes** *JOURNAL OF FLUID MECHANICS*
Mani, A., Moin, P., Wang, M.
2009; 625: 273-298
- **A dynamic global-coefficient subgrid-scale model for large-eddy simulation of turbulent scalar transport in complex geometries** *PHYSICS OF FLUIDS*
You, D., Moin, P.
2009; 21 (4)
- **Large-eddy simulation of evaporating spray in a coaxial combustor** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
Apte, S. V., Mahesh, K., Moin, P.
2009; 32: 2247-2256
- **Active Control of Flow Separation Over an Airfoil Using Synthetic Jets** *IUTAM Symposium on Unsteady Separated Flows and their Control*
You, D., Moin, P.
SPRINGER.2009: 551–561
- **Numerical Experiments with Shock-Turbulence Interaction** *3rd International Conference on Numerical Modeling of Space Plasma Flows*
Lele, S. K., Larsson, J., Bhagatwala, A., Moin, P.
ASTRONOMICAL SOC PACIFIC.2009: 31–41
- **Stochastic modeling of atomizing spray in a complex swirl injector using large eddy simulation** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
Apte, S. V., Mahesh, K., Gorokhovski, M., Moin, P.
2009; 32: 2257-2266

- **MINIMAL REPETITION DYNAMIC CHECKPOINTING ALGORITHM FOR UNSTEADY ADJOINT CALCULATION** *SIAM JOURNAL ON SCIENTIFIC COMPUTING*
Wang, Q., Moin, P., Iaccarino, G.
2009; 31 (4): 2549-2567
- **Resolution requirements for aero-optical simulations** *JOURNAL OF COMPUTATIONAL PHYSICS*
Mani, A., Wang, M., Moin, P.
2008; 227 (21): 9008-9020
- **Active control of flow separation over an airfoil using synthetic jets** *IUTAM Symposium on Unsteady Separated Flows and their Control*
You, D., Moin, P.
ACADEMIC PRESS LTD- ELSEVIER SCIENCE LTD.2008: 1349-57
- **Nonlinear evolution of the Richtmyer-Meshkov instability** *JOURNAL OF FLUID MECHANICS*
Herrmann, M., Moin, P., Abarzhi, S. I.
2008; 612: 311-338
- **Preface to Special Topic: Turbulence Physics and Control - Papers from a Workshop in Honor of John Kim's 60th Birthday, Stanford, California, September 2007** *PHYSICS OF FLUIDS*
Choi, H., Moin, P.
2008; 20 (10)
- **Discrete conservation principles in large-eddy simulation with application to separation control over an airfoil** *Workshop on Turbulence Physics and Control*
You, D., Ham, F., Moin, P.
AMER INST PHYSICS.2008
- **A direct numerical simulation study on the mean velocity characteristics in turbulent pipe flow** *JOURNAL OF FLUID MECHANICS*
Wu, X., Moin, P.
2008; 608: 81-112
- **A predictive wall model for large-eddy simulation based on optimal control techniques** *PHYSICS OF FLUIDS*
Templeton, J. A., Wang, M., Moin, P.
2008; 20 (6)
- **A Monte Carlo method for solving unsteady adjoint equations** *JOURNAL OF COMPUTATIONAL PHYSICS*
Wang, Q., Gleich, D., Saberi, A., Etemadi, N., Moin, P.
2008; 227 (12): 6184-6205
- **Toward petascale shock/turbulence computations** *4th Annual Scientific Discovery Through Advanced Computing Conference (SciDAC 2008)*
Larsson, J., Johnsen, E., Lele, S. K., Moin, P.
IOP PUBLISHING LTD.2008
- **Large-eddy simulation analysis of mechanisms for viscous losses in a turbomachinery tip-clearance flow** *JOURNAL OF FLUID MECHANICS*
You, D., Wang, M., Moin, P., Mittal, R.
2007; 586: 177-204
- **Effects of hydrophobic surfaces on the drag and lift of a circular cylinder** *PHYSICS OF FLUIDS*
You, D., Moin, P.
2007; 19 (8)
- **Vortex dynamics and low-pressure fluctuations in the tip-clearance flow** *JOURNAL OF FLUIDS ENGINEERING-TRANSACTIONS OF THE ASME*
You, D., Wang, M., Moin, P., Mittal, R.
2007; 129 (8): 1002-1014
- **A dynamic global-coefficient subgrid-scale eddy-viscosity model for large-eddy simulation in complex geometries** *PHYSICS OF FLUIDS*
You, D., Moin, P.
2007; 19 (6)
- **Trailing-edge noise reduction using derivative-free optimization and large-eddy simulation** *JOURNAL OF FLUID MECHANICS*
Marsden, A. L., Wang, M., Dennis, J. E., Moin, P.

2007; 572: 13-36

- **Complex effects in large eddy simulations** *Symposium on Complex Effects in Large Eddy Simulation*
Moin, P., Iaccarino, G.
SPRINGER.2007: 1-?
- **Towards time-stable and accurate LES on unstructured grids** *Symposium on Complex Effects in Large Eddy Simulation*
Ham, F., Mattsson, K., Iaccarino, G., Moin, P.
SPRINGER.2007: 235-?
- **Computational issues and algorithm assessment for shock/turbulence interaction problems** *3rd Annual Scientific Discovery through Advanced Computing Conference (SciDAC 2007)*
Larsson, J., Cook, A., Lele, S. K., Moin, P., Cabot, B., Sjoegreen, B., Yee, H., Zhong, X.
IOP PUBLISHING LTD.2007
- **Application of a dynamic global-coefficient subgrid-scale model for large-eddy simulation in complex geometries** *5th Joint ASME/JSME Fluids Engineering Summer Conference*
You, D., Moin, P.
AMER SOC MECHANICAL ENGINEERS.2007: 1429-1437
- **Numerical Simulations of the bursting of a laminar separation bubble and its relation to airfoil stall** *11th EUROMECH European Turbulence Conference*
Marxen, O., You, D., Moin, P.
SPRINGER-VERLAG BERLIN.2007: 712-714
- **Statistical description of the free-space propagation of highly aberrated optical beams** *JOURNAL OF THE OPTICAL SOCIETY OF AMERICA A-OPTICS IMAGE SCIENCE AND VISION*
Mani, A., Wang, M., Moin, P.
2006; 23 (12): 3027-3035
- **Large-eddy simulations of longitudinal vortices embedded in a turbulent boundary layer** *AIAA JOURNAL*
You, D., Wang, M., Mittal, R., Moin, P.
2006; 44 (12): 3032-3039
- **Direct numerical simulation of polymer-induced drag reduction in turbulent boundary layer flow of inhomogeneous polymer solutions** *JOURNAL OF FLUID MECHANICS*
Dimitropoulos, C. D., Dubief, Y., Shaqfeh, E. S., Moin, P.
2006; 566: 153-162
- **A quasi-generalized-coordinate approach for numerical simulation of complex flows** *JOURNAL OF FLUIDS ENGINEERING-TRANSACTIONS OF THE ASME*
You, D., Wang, M., Mittal, R., Moin, P.
2006; 128 (6): 1394-1399
- **Large-eddy simulation of flow over a wall-mounted hump with separation control** *AIAA JOURNAL*
You, D., Wang, M., Moin, P.
2006; 44 (11): 2571-2577
- **Effects of tip-gap size on the tip-leakage flow in a turbomachinery cascade** *PHYSICS OF FLUIDS*
You, D., Wang, M., Moin, P., Mittal, R.
2006; 18 (10)
- **Large-eddy simulation of reacting turbulent flows in complex geometries** *4th ASME/JSME Joint Fluids Engineering Conference*
Mahesh, K., Constantinescu, G., Apte, S., Iaccarino, G., Ham, F., Moin, P.
ASME.2006: 374-81
- **Large-eddy simulation of realistic gas turbine combustors** *AIAA 42nd Aerospace Sciences Meeting and Exhibit*
Moin, P., Apte, S. V.
AMER INST AERONAUTICS ASTRONAUTICS.2006: 698-708
- **Analysis of stability and accuracy of finite-difference schemes on a skewed mesh** *JOURNAL OF COMPUTATIONAL PHYSICS*
You, D. Y., Mittal, R., Wang, M., Moin, P.

2006; 213 (1): 184-204

- **Partially reflecting and non-reflecting boundary conditions for simulation of compressible viscous flow** *11th International Congress on Sound and Vibration*
Polifke, W., Wall, C., Moin, P.
ACADEMIC PRESS INC ELSEVIER SCIENCE.2006: 437–49
- **Computational study on the internal layer in a diffuser** *JOURNAL OF FLUID MECHANICS*
Wu, X. H., Schluter, J., Moin, P., Pitsch, H., Iaccarino, G., Ham, F.
2006; 550: 391-412
- **An efficient wall model for large-eddy simulation based on optimal control theory** *PHYSICS OF FLUIDS*
Templeton, J. A., Wang, M., Moin, P.
2006; 18 (2)
- **Wall modeling for large-eddy simulation of turbulent boundary layers** *IUTAM Symposium on One Hundred Years of Boundary Layer Research*
Moin, P., Wang, M.
SPRINGER.2006: 269–278
- **An experimental and numerical investigation of drag reduction in a turbulent boundary layer using a rigid rodlike polymer** *PHYSICS OF FLUIDS*
Paschkewitz, J. S., Dimitropoulos, C. D., Hou, Y. X., Somandepalli, V. S., Mungal, M. G., Shaqfeh, E. S., Moin, P.
2005; 17 (8)
- **New answers on the interaction between polymers and vortices in turbulent flows** *FLOW TURBULENCE AND COMBUSTION*
Dubief, Y., Terrapon, V. E., White, C. M., Shaqfeh, E. S., Moin, P., Lele, S. K.
2005; 74 (4): 311-329
- **Direct numerical simulation of polymer-induced drag reduction in turbulent boundary layer flow** *PHYSICS OF FLUIDS*
Dimitropoulos, C. D., Dubief, Y., Shaqfeh, E. S., Moin, P., Lele, S. K.
2005; 17 (1)
- **Large-eddy simulation of rotor tip-clearance flows: Computational challenges and accomplishments** *Annual Conference on High Performance Computing Modernization Program*
Moin, P., Wang, M., You, D., Mittal, R.
IEEE COMPUTER SOC.2005: 134–141
- **Vortex dynamics and mechanisms for viscous losses in the tip-clearance flow** *ASME Fluids Engineering Division Summer Meeting*
You, D., Wang, M., Moin, P., Mittal, R.
AMER SOC MECHANICAL ENGINEERS.2005: 1601–1610
- **Outflow conditions for integrated large eddy simulation/Reynolds-averaged Navier-Stokes simulations** *AIAA 32nd Fluid Dynamics Conference*
Schluter, J. U., Pitsch, H., Moin, P.
AMER INST AERONAUT ASTRONAUT.2005: 156–64
- **Higher entropy conservation and numerical stability of compressible turbulence simulations** *JOURNAL OF COMPUTATIONAL PHYSICS*
Honein, A. E., Moin, P.
2004; 201 (2): 531-545
- **Numerical simulation of turbulent drag reduction using rigid fibres** *JOURNAL OF FLUID MECHANICS*
Paschkewitz, J. S., Dubief, Y., Dimitropoulos, C. D., Shaqfeh, E. S., Moin, P.
2004; 518: 281-317
- **Study of tip-clearance flow in turbomachines using large-eddy simulation** *COMPUTING IN SCIENCE & ENGINEERING*
You, D. H., Wang, M., Moin, P., Mittal, R.
2004; 6 (6): 38-46
- **Suppression of vortex-shedding noise via derivative-free shape optimization** *PHYSICS OF FLUIDS*
Marsden, A. L., Wang, M., Dennis, J. E., Moin, P.
2004; 16 (10): L83-L86
- **On the coherent drag-reducing and turbulence-enhancing behaviour of polymers in wall flows** *JOURNAL OF FLUID MECHANICS*
Dubief, Y., White, C. M., Terrapon, V. E., Shaqfeh, E. S., Moin, P., Lele, S. K.

2004; 514: 271-280

- **A numerical method for large-eddy simulation in complex geometries** *JOURNAL OF COMPUTATIONAL PHYSICS*
Mahesh, K., Constantinescu, G., Moin, P.
2004; 197 (1): 215-240
- **Optimal aeroacoustic shape design using the surrogate management framework** *OPTIMIZATION AND ENGINEERING*
Marsden, A. L., Wang, M., Dennis, J. E., Moin, P.
2004; 5 (2): 235-262
- **Large-eddy simulation of conductive flows at low magnetic Reynolds number** *PHYSICS OF FLUIDS*
Knaepen, B., Moin, P.
2004; 16 (5): 1255-1261
- **Simulated polymer stretch in a turbulent flow using Brownian dynamics** *JOURNAL OF FLUID MECHANICS*
Terrapon, V. E., Dubief, Y., Moin, P., Shaqfeh, E. S., Lele, S. K.
2004; 504: 61-71
- **Progress-variable approach for large-eddy simulation of non-premixed turbulent combustion** *JOURNAL OF FLUID MECHANICS*
Pierce, C. D., Moin, P.
2004; 504: 73-97
- **Large eddy simulation inflow conditions for coupling with Reynolds-averaged flow solvers** *AIAA 41st Aerospace Sciences Meeting and Exhibit*
Schluter, J. U., Pitsch, H., Moin, P.
AMER INST AERONAUT ASTRONAUT.2004: 478-84
- **Computational methodology for large-eddy simulation of tip-clearance flows** *AIAA JOURNAL*
You, D. H., Mittal, R., Wang, M., Moin, P.
2004; 42 (2): 271-279
- **Large eddy simulation of multi-phase turbulent flows in realistic combustors** *Workshop on Trends in Numerical and Physical Modelling for Turbulent Processes in Gas Turbine Combustors*
Moin, P.
INDERSCIENCE ENTERPRISES LTD.2004: 237-40
- **Prediction and analysis of rotor tip-clearance flows using large-eddy simulation** *Users Group Conference*
You, D. Y., Wang, M., Moin, P., Mittal, R.
IEEE COMPUTER SOC.2004: 158-165
- **Large-eddy simulation of multiphase flows in complex combustors** *2nd International Conference on Computational Methods in Multiphase Flow*
Apte, S. V., Mahesh, K., Ham, F., Constantinescu, G., Moin, P.
WIT PRESS.2004: 53-62
- **Combustion instability due to the nonlinear interaction between sound and flame** *JOURNAL OF FLUID MECHANICS*
Wu, X. S., Wang, M., Moin, P., Peters, N.
2003; 497: 23-53
- **LES of atomizing spray with stochastic modeling of secondary breakup** *INTERNATIONAL JOURNAL OF MULTIPHASE FLOW*
Apte, S. V., Gorokhovski, M., Moin, P.
2003; 29 (9): 1503-1522
- **Numerical simulation of the flow around a circular cylinder at high Reynolds numbers** *5th International Symposium on Engineering Turbulence Modelling and Measurements*
Catalano, P., Wang, M., Iaccarino, G., Moin, P.
ELSEVIER SCIENCE INC.2003: 463-69
- **Large-eddy simulation of swirling particle-laden flows in a coaxial-jet combustor** *INTERNATIONAL JOURNAL OF MULTIPHASE FLOW*
Apte, S. V., Mahesh, K., Moin, P., Oefelein, J. C.
2003; 29 (8): 1311-1331
- **Thermal conduction in magnetized turbulent gas** *ASTROPHYSICAL JOURNAL*

Cho, J., Lazarian, A., Honein, A., Knaepen, B., Kassinos, S., Moin, P.

2003; 589 (2): L77-L80

- **A further study of numerical errors in large-eddy simulations** *JOURNAL OF COMPUTATIONAL PHYSICS*
Chow, F. K., Moin, P.
2003; 184 (2): 366-380
- **A numerical method for large-eddy simulation in complex geometries** *2nd MIT Conference on Computational Fluid and Solid Mechanics*
Mahesh, K., Constantinescu, G., Moin, P.
ELSEVIER SCIENCE BV.2003: 23-30
- **Large-eddy simulation and analysis of tip-clearance flows in turbomachinery applications** *Users Group 2003 Conference*
You, D. Y., Wang, M., Moin, P., Mittal, R.
IEEE COMPUTER SOC.2003: 180-187
- **Large eddy simulation of a road vehicle with drag-reduction devices** *AIAA JOURNAL*
Verzicco, R., Fatica, M., Iaccarino, G., Moin, P.
2002; 40 (12): 2447-2455
- **Advances in large eddy simulation methodology for complex flows** *INTERNATIONAL JOURNAL OF HEAT AND FLUID FLOW*
Moin, P.
2002; 23 (5): 710-720
- **A semi-implicit method for resolution of acoustic waves in low Mach number flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
Wall, C., Pierce, C. D., Moin, P.
2002; 181 (2): 545-563
- **Dynamic wall modeling for large-eddy simulation of complex turbulent flows** *PHYSICS OF FLUIDS*
Wang, M., Moin, P.
2002; 14 (7): 2043-2051
- **A numerical method to simulate radio-frequency plasma discharges** *JOURNAL OF COMPUTATIONAL PHYSICS*
Hammond, E. P., Mahesh, K., Moin, P.
2002; 176 (2): 402-429
- **Construction of commutative filters for LES on unstructured meshes** *JOURNAL OF COMPUTATIONAL PHYSICS*
Marsden, A. L., Vasilyev, O. V., Moin, P.
2002; 175 (2): 584-603
- **Numerical simulation of the flow around a circular cylinder at high Reynolds number** *5th International Symposium on Engineering Turbulence Modelling and Measurements*
Catalano, P., Wang, M., Iaccarino, G., Moin, P.
ELSEVIER SCIENCE BV.2002: 657-665
- **Progress in control of mixing and large eddy simulation of turbulent combustion** *IUTAM Symposium on Turbulent Mixing and Combustion*
Moin, P.
SPRINGER.2002: 305-314
- **DNS-based predictive control of turbulence: an optimal benchmark for feedback algorithms** *JOURNAL OF FLUID MECHANICS*
Bewley, T. R., Moin, P., Temam, R.
2001; 447: 179-225
- **Large eddy simulation wall-modeling based on suboptimal control theory and linear stochastic estimation** *PHYSICS OF FLUIDS*
Nicoud, F., Baggett, J. S., Moin, P., Cabot, W.
2001; 13 (10): 2968-2984
- **Computation of trailing-edge flow and noise using large-Eddy simulation** *3rd ASME/JSME Joint Fluids Engineering Conference, FEDSM99-7231*
Wang, M., Moin, P.
AMER INST AERONAUT ASTRONAUT.2000: 2201-9

-
- **Numerical simulation of a Mach 1.92 turbulent jet and its sound field** *AIAA/CEAS 4th Aeroacoustics Conference*
Freund, J. B., Lele, S. K., Moin, P.
AMER INST AERONAUT ASTRONAUT.2000: 2023–31
 - **Compressibility effects in a turbulent annular mixing layer. Part 2. Mixing of a passive scalar** *JOURNAL OF FLUID MECHANICS*
Freund, J. B., Moin, P., Lele, S. K.
2000; 421: 269-292
 - **Compressibility effects in a turbulent annular mixing layer. Part 1. Turbulence and growth rate** *JOURNAL OF FLUID MECHANICS*
Freund, J. B., Lele, S. K., Moin, P.
2000; 421: 229-267
 - **Jet mixing enhancement by high-amplitude fluidic actuation** *AIAA JOURNAL*
Freund, J. B., Moin, P.
2000; 38 (10): 1863-1870
 - **An evaluation of the assumed beta probability density function subgrid-scale model for large eddy simulation of nonpremixed, turbulent combustion with heat release** *PHYSICS OF FLUIDS*
WALL, C., Boersma, B. J., Moin, P.
2000; 12 (10): 2522-2529
 - **Numerical studies of flow over a circular cylinder at Re-D=3900** *PHYSICS OF FLUIDS*
Kravchenko, A. G., Moin, P.
2000; 12 (2): 403-417
 - **Approximate wall boundary conditions in the large-eddy simulation of high reynolds number flow** *FLOW TURBULENCE AND COMBUSTION*
Cabot, W., Moin, P.
2000; 63 (1-4): 269-291
 - **Large eddy simulation of turbulent, nonpremixed combustion** *8th European Turbulence Conference*
Moin, P., Pierce, C., Pitsch, H.
INT CENTER NUMERICAL METHODS ENGINEERING.2000: 385–392
 - **Space-time characteristics of the wall shear-stress fluctuations in a low-Reynolds-number channel flow** *PHYSICS OF FLUIDS*
Jeon, S., Choi, H., Yoo, J. Y., Moin, P.
1999; 11 (10): 3084-3094
 - **Study of flow in a planar asymmetric diffuser using large-eddy simulation** *JOURNAL OF FLUID MECHANICS*
Kaltenbach, H. J., Fatica, H., Mittal, R., Lund, T. S., Moin, P.
1999; 390: 151-185
 - **B-spline method and zonal grids for simulations of complex turbulent flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
Kravchenko, A. G., Moin, P., Shariff, K.
1999; 151 (2): 757-789
 - **Direct computation of the sound generated by vortex pairing in an axisymmetric jet** *JOURNAL OF FLUID MECHANICS*
Mitchell, B. E., Lele, S. K., Moin, P.
1999; 383: 113-142
 - **Control of turbulent flows** *18th IFIP TC7 Conference on Systems Modelling and Optimization*
Temam, R., Bewley, T., Moin, P.
CRC PRESS-TAYLOR & FRANCIS GROUP.1999: 3–11
 - **The structure of wall-pressure fluctuations in turbulent boundary layers with adverse pressure gradient and separation** *JOURNAL OF FLUID MECHANICS*
Na, Y., Moin, P.
1998; 377: 347-373
 - **A dynamic model for subgrid-scale variance and dissipation rate of a conserved scalar** *PHYSICS OF FLUIDS*
Pierce, C. D., Moin, P.

1998; 10 (12): 3041-3044

- **Direct numerical simulation of a separated turbulent boundary layer** *JOURNAL OF FLUID MECHANICS*
Na, Y., Moin, P.
1998; 374: 379-405
- **A general class of commutative filters for LES in complex geometries** *JOURNAL OF COMPUTATIONAL PHYSICS*
Vasilyev, O. V., Lund, T. S., Moin, P.
1998; 146 (1): 82-104
- **Direct numerical simulation of a separated turbulent boundary layer** *JOURNAL OF FLUID MECHANICS*
Na, Y., Moin, P.
1998; 370: 175-201
- **Observed mechanisms for turbulence attenuation and enhancement in opposition-controlled wall-bounded flows** *PHYSICS OF FLUIDS*
Hammond, E. P., Bewley, T. R., Moin, P.
1998; 10 (9): 2421-2423
- **Method for generating equilibrium swirling inflow conditions** *AIAA JOURNAL*
Pierce, C. D., Moin, P.
1998; 36 (7): 1325-1327
- **Fully conservative higher order finite difference schemes for incompressible flow** *JOURNAL OF COMPUTATIONAL PHYSICS*
Morinishi, Y., Lund, T. S., Vasilyev, O. V., Moin, P.
1998; 143 (1): 90-124
- **Numerical and physical issues in large eddy simulation of turbulent flows** *JSME INTERNATIONAL JOURNAL SERIES B-FLUIDS AND THERMAL ENGINEERING*
Moin, P.
1998; 41 (2): 454-463
- **Direct numerical simulation: A tool in turbulence research** *ANNUAL REVIEW OF FLUID MECHANICS*
Moin, P., Mahesh, K.
1998; 30: 539-578
- **Direct computation of Mach wave radiation in an axisymmetric supersonic jet** *AIAA JOURNAL*
Mitchell, B. E., Lele, S. K., Moin, P.
1997; 35 (10): 1574-1580
- **Suitability of upwind-biased finite difference schemes for Large-Eddy simulation of turbulent flows** *AIAA JOURNAL*
Mittal, R., Moin, P.
1997; 35 (8): 1415-1417
- **Interaction of isotropic turbulence with shock waves: Effect of shock strength** *JOURNAL OF FLUID MECHANICS*
Lee, S. S., Lele, S. K., Moin, P.
1997; 340: 225-247
- **The influence of entropy fluctuations on the interaction of turbulence with a shock wave** *JOURNAL OF FLUID MECHANICS*
Mahesh, K., Lele, S. K., Moin, P.
1997; 334: 353-379
- **On the effect of numerical errors in large eddy simulations of turbulent flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
Kravchenko, A. G., Moin, P.
1997; 131 (2): 310-322
- **Direct numerical simulation of turbulent flow over a backward-facing step** *JOURNAL OF FLUID MECHANICS*
Le, H., Moin, P., Kim, J.
1997; 330: 349-374
- **Sound generation in a mixing layer** *JOURNAL OF FLUID MECHANICS*
Colonius, T., Lele, S. K., Moin, P.

1997; 330: 375-409

- **Tackling turbulence with supercomputers** *SCIENTIFIC AMERICAN*
Moin, P., Kim, J.
1997; 276 (1): 62-68
- **Computation of quadrupole noise using acoustic analogy** *AIAA JOURNAL*
Wang, M., Lele, S. K., Moin, P.
1996; 34 (11): 2247-2254
- **Zonal embedded grids for numerical simulations of wall-bounded turbulent flows** *JOURNAL OF COMPUTATIONAL PHYSICS*
Kravchenko, A. G., Moin, P., Moser, R.
1996; 127 (2): 412-423
- **Sound radiation during local laminar breakdown in a low-Mach-number boundary layer** *JOURNAL OF FLUID MECHANICS*
Wang, M., Lele, S. K., Moin, P.
1996; 319: 197-218
- **Large-eddy simulation of a concave wall boundary layer** *10th Symposium on Turbulent Shear Flows*
Lund, T. S., Moin, P.
ELSEVIER SCIENCE INC. 1996: 290-95
- **Large-eddy simulation of turbulent confined coannular jets** *JOURNAL OF FLUID MECHANICS*
AKSELVOLL, K., Moin, P.
1996; 315: 387-411
- **An efficient method for temporal integration of the Navier-Stokes equations in confined axisymmetric geometries** *JOURNAL OF COMPUTATIONAL PHYSICS*
AKSELVOLL, K., Moin, P.
1996; 125 (2): 454-463
- **THE INTERACTION OF AN ISOTROPIC FIELD OF ACOUSTIC-WAVES WITH A SHOCK-WAVE** *JOURNAL OF FLUID MECHANICS*
Mahesh, K., Lee, S. S., Lele, S. K., Moin, P.
1995; 300: 383-407
- **SHEAR-FREE TURBULENT BOUNDARY-LAYERS .1. PHYSICAL INSIGHTS INTO NEAR-WALL TURBULENCE** *JOURNAL OF FLUID MECHANICS*
Perot, B., Moin, P.
1995; 295: 199-227
- **SHEAR-FREE TURBULENT BOUNDARY-LAYERS .2. NEW CONCEPTS FOR REYNOLDS STRESS TRANSPORT-EQUATION MODELING OF INHOMOGENEOUS FLOWS** *JOURNAL OF FLUID MECHANICS*
Perot, B., Moin, P.
1995; 295: 229-245
- **THE BASIC EQUATIONS FOR THE LARGE-EDDY SIMULATION OF TURBULENT FLOWS IN COMPLEX-GEOMETRY** *JOURNAL OF COMPUTATIONAL PHYSICS*
Ghosal, S., Moin, P.
1995; 118 (1): 24-37
- **A DYNAMIC LOCALIZATION MODEL FOR LARGE-EDDY SIMULATION OF TURBULENT FLOWS** *JOURNAL OF FLUID MECHANICS*
Ghosal, S., Lund, T. S., Moin, P., AKSELVOLL, K.
1995; 286: 229-255
- **ON THE REPRESENTATION OF BACKSCATTER IN DYNAMIC LOCALIZATION MODELS** *PHYSICS OF FLUIDS*
Carati, D., Ghosal, S., Moin, P.
1995; 7 (3): 606-616
- **DIRECT COMPUTATION OF THE SOUND FROM A COMPRESSIBLE CO-ROTATING VORTEX PAIR** *JOURNAL OF FLUID MECHANICS*
Mitchell, B. E., Lele, S. K., Moin, P.
1995; 285: 181-202

-
- **EFFECTS OF CONVEX TRANSVERSE CURVATURE ON WALL-BOUNDED TURBULENCE .1. THE VELOCITY AND VORTICITY** *JOURNAL OF FLUID MECHANICS*
Neves, J. C., Moin, P., Moser, R. D.
1994; 272: 349-381
 - **EFFECTS OF CONVEX TRANSVERSE CURVATURE ON WALL-BOUNDED TURBULENCE .2. THE PRESSURE-FLUCTUATIONS** *JOURNAL OF FLUID MECHANICS*
Neves, J. C., Moin, P.
1994; 272: 383-406
 - **EFFECTS OF THE COMPUTATIONAL TIME-STEP ON NUMERICAL-SOLUTIONS OF TURBULENT-FLOW** *JOURNAL OF COMPUTATIONAL PHYSICS*
Choi, H., Moin, P.
1994; 113 (1): 1-4
 - **ACTIVE TURBULENCE CONTROL FOR DRAG REDUCTION IN WALL-BOUNDED FLOWS** *JOURNAL OF FLUID MECHANICS*
Choi, H., Moin, P., Kim, J.
1994; 262: 75-110
 - **THE SCATTERING OF SOUND-WAVES BY A VORTEX - NUMERICAL SIMULATIONS AND ANALYTICAL SOLUTIONS** *JOURNAL OF FLUID MECHANICS*
Colonius, T., Lele, S. K., Moin, P.
1994; 260: 271-298
 - **THE RESPONSE OF ANISOTROPIC TURBULENCE TO RAPID HOMOGENEOUS ONE-DIMENSIONAL COMPRESSION** *Symposium on Turbulence, in honor of the 60th Birthday of William Craig Reynolds*
Mahesh, K., Lele, S. K., Moin, P.
AMER INST PHYSICS.1994: 1052-62
 - **IN HONOR OF REYNOLDS, WILLIAM, CRAIG ON THE OCCASION OF HIS 60TH BIRTHDAY** *PHYSICS OF FLUIDS*
Hussain, F., Moin, P., Mansour, N., Ferziger, J.
1994; 6 (2): R3-R3
 - **DIRECT NUMERICAL-SIMULATION OF TRANSITION AND TURBULENCE IN A SPATIALLY EVOLVING BOUNDARY-LAYER** *JOURNAL OF COMPUTATIONAL PHYSICS*
Rai, M. M., Moin, P.
1993; 109 (2): 169-192
 - **ON THE RELATION OF NEAR-WALL STREAMWISE VORTICES TO WALL SKIN FRICTION IN TURBULENT BOUNDARY-LAYERS** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Kravchenko, A. G., Choi, H. C., Moin, P.
1993; 5 (12): 3307-3309
 - **DIRECT NUMERICAL-SIMULATION OF TURBULENT-FLOW OVER RIBBLETS** *JOURNAL OF FLUID MECHANICS*
Choi, H., Moin, P., Kim, J.
1993; 255: 503-539
 - **BOUNDARY-CONDITIONS FOR DIRECT COMPUTATION OF AERODYNAMIC SOUND GENERATION** *AIAA JOURNAL*
Colonius, T., Lele, S. K., Moin, P.
1993; 31 (9): 1574-1582
 - **FEEDBACK-CONTROL FOR UNSTEADY-FLOW AND ITS APPLICATION TO THE STOCHASTIC BURGERS-EQUATION** *JOURNAL OF FLUID MECHANICS*
Choi, H. C., Temam, R., Moin, P., Kim, J.
1993; 253: 509-543
 - **DIRECT NUMERICAL-SIMULATION OF ISOTROPIC TURBULENCE INTERACTING WITH A WEAK SHOCK-WAVE** *JOURNAL OF FLUID MECHANICS*
Lee, S. S., Lele, S. K., Moin, P.
1993; 251: 533-562

-
- **PROSPECTS OF PHYSICAL AND NUMERICAL EXPERIMENTS FOR THE FUNDAMENTAL UNDERSTANDING OF TURBULENCE** *Colloquium on New Approaches and Concepts in Turbulence*
Adrian, R., Antonia, R., Dracos, T., FRISCH, U., LANDAHL, M., Lesieur, M., Moin, P., Reynolds, W., Wygnanski, I., YAGLOM, A.
BIRKHAUSER VERLAG.1993: 395–398
 - **THE DIMENSION OF ATTRACTORS UNDERLYING PERIODIC TURBULENT POISEUILLE FLOW** *JOURNAL OF FLUID MECHANICS*
Keefe, L., Moin, P., Kim, J.
1992; 242: 1-29
 - **SIMULATION OF SPATIALLY EVOLVING TURBULENCE AND THE APPLICABILITY OF TAYLOR HYPOTHESIS IN COMPRESSIBLE FLOW** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Lee, S., Lele, S. K., Moin, P.
1992; 4 (7): 1521-1530
 - **THE COMPUTATION OF TURBULENCE** *AEROSPACE AMERICA*
Moin, P.
1992; 30 (1): 42-46
 - **A DYNAMIC SUBGRID-SCALE MODEL FOR COMPRESSIBLE TURBULENCE AND SCALAR TRANSPORT** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Moin, P., Squires, K., Cabot, W., Lee, S.
1991; 3 (11): 2746-2757
 - **THE FREE COMPRESSIBLE VISCOUS VORTEX** *JOURNAL OF FLUID MECHANICS*
Colonus, T., Lele, S. K., Moin, P.
1991; 230: 45-73
 - **DIRECT SIMULATIONS OF TURBULENT-FLOW USING FINITE-DIFFERENCE SCHEMES** *JOURNAL OF COMPUTATIONAL PHYSICS*
Rai, M. M., Moin, P.
1991; 96 (1): 15-53
 - **ON THE EFFECT OF RIBLET IN FULLY-DEVELOPED LAMINAR CHANNEL FLOWS** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Choi, H. C., Moin, P., Kim, J.
1991; 3 (8): 1892-1896
 - **SUBGRID-SCALE BACKSCATTER IN TURBULENT AND TRANSITIONAL FLOWS** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Piomelli, U., Cabot, W. H., Moin, P., Lee, S. S.
1991; 3 (7): 1766-1771
 - **A DYNAMIC SUBGRID-SCALE EDDY VISCOSITY MODEL** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Germano, M., Piomelli, U., Moin, P., Cabot, W. H.
1991; 3 (7): 1760-1765
 - **TOWARDS LARGE EDDY AND DIRECT SIMULATION OF COMPLEX TURBULENT FLOWS** *SYMP ON RECENT DEVELOPMENTS IN LARGE-SCALE COMPUTATIONAL FLUID DYNAMICS*
Moin, P.
ELSEVIER SCIENCE SA.1991: 329–34
 - **THE MINIMAL FLOW UNIT IN NEAR-WALL TURBULENCE** *JOURNAL OF FLUID MECHANICS*
Jimenez, J., Moin, P.
1991; 225: 213-240
 - **EDDY SHOCKLETS IN DECAYING COMPRESSIBLE TURBULENCE** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Lee, S., Lele, S. K., Moin, P.
1991; 3 (4): 657-664
 - **AN IMPROVEMENT OF FRACTIONAL STEP METHODS FOR THE INCOMPRESSIBLE NAVIER-STOKES EQUATIONS** *JOURNAL OF COMPUTATIONAL PHYSICS*
Le, H., Moin, P.
1991; 92 (2): 369-379

- **Large Eddy Simulation of the Flow in a Transpired Channel** *JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER*
Piomelli, U., Moin, P., Ferziger, J.
1991; 5 (1): 124-128
- **DIRECT NUMERICAL-SIMULATION OR EXPERIMENTS - DISCUSSION** *NATO ADVANCED RESEARCH WORKSHOP ON THE GLOBAL GEOMETRY OF TURBULENCE*
Roshko, A., Kleiser, L., Moin, P., LUMLEY, METAIS, FAUVE, ZABUSKY, PAPAILIOU, WYGNANSKI, SAFFMAN, Reynolds, LESIEUR, AHLERS
PLENUM PRESS DIV PLENUM PUBLISHING CORP.1991: 331-339
- **DIRECT NUMERICAL-SIMULATION OF TRANSITION AND TURBULENCE IN A SPATIALLY EVOLVING BOUNDARY-LAYER** *10TH CONF ON COMPUTATIONAL FLUID DYNAMICS*
Rai, M. M., Moin, P.
AMER INST AERONAUTICS & ASTRONAUTICS.1991: 890-914
- **THE STRUCTURE OF 2-DIMENSIONAL SEPARATION** *JOURNAL OF FLUID MECHANICS*
Pauley, L. L., Moin, P., Reynolds, W. C.
1990; 220: 397-411
- **DIRECT NUMERICAL-SIMULATION OF A 3-DIMENSIONAL TURBULENT BOUNDARY-LAYER** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Moin, P., Shih, T. H., Driver, D., Mansour, N. N.
1990; 2 (10): 1846-1853
- **ON THE SPACE-TIME CHARACTERISTICS OF WALL-PRESSURE FLUCTUATIONS** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Choi, H., Moin, P.
1990; 2 (8): 1450-1460
- **STRUCTURE OF TURBULENCE AT HIGH SHEAR RATE** *JOURNAL OF FLUID MECHANICS*
Lee, M. J., Kim, J., Moin, P.
1990; 216: 561-583
- **WHAT CAN WE HOPE FOR FROM CELLULAR AUTOMATA - DISCUSSION** *WORKSHOP ON WHITHER TURBULENCE : TURBULENCE AT THE CROSSROADS*
KARWEIT, M. J., Cantwell, B., FRISCH, U., Narasimha, R., Nagib, H., Doolen, G., Holmes, P., Jimenez, J., TRAUGOTT, S., Boris, J., Goren, S., Moin, P.
SPRINGER-VERLAG BERLIN.1990: 426-435
- **APPLICATIONS OF CHAOS THEORY TO SHEAR TURBULENCE** *1989 ANNUAL MEETING OF THE AMERICAN ASSOC FOR THE ADVANCEMENT OF SCIENCE*
Keefe, L., Moin, P., Kim, J.
AMER ASSOC ADVANCEMENT SCIENCE.1990: 56-63
- **UTILITY OF DYNAMIC-SYSTEMS APPROACH - DISCUSSION** *WORKSHOP ON WHITHER TURBULENCE : TURBULENCE AT THE CROSSROADS*
Aubry, N., Perry, T., Lumley, J., Holmes, P., FRISCH, U., Sudan, R., Moffatt, K., Phillips, B., Marsden, J., George, B., Roshko, A., Hussain, F., Reynolds, et al
SPRINGER-VERLAG BERLIN.1990: 292-305
- **THE ROLE OF COHERENT STRUCTURES - DISCUSSION** *WORKSHOP ON WHITHER TURBULENCE : TURBULENCE AT THE CROSSROADS*
ELTAHRY, S., Hunt, J., Perry, A., George, W., Hussain, F., MORKOVIN, M., Kline, S., Jimenez, J., Moin, P., Stull, R., Herring, J., Sudan, R., SCHUMANN, et al
SPRINGER-VERLAG BERLIN.1990: 170-191
- **THE POTENTIAL AND LIMITATIONS OF DIRECT AND LARGE EDDY SIMULATIONS - DISCUSSION** *WORKSHOP ON WHITHER TURBULENCE : TURBULENCE AT THE CROSSROADS*
Keefe, L., Herring, J., Reynolds, B., Lesieur, M., SCHUMANN, U., Boris, J., Roshko, A., Moin, P., Novikov, E., Hunt, J., Kline, S., Narasimha, R., Lumley, et al
SPRINGER-VERLAG BERLIN.1990: 374-393
- **NEAR-WALL κ -epsilon-TURBULENCE MODELING** *AIAA JOURNAL*
Mansour, N. N., Kim, J., Moin, P.
1989; 27 (8): 1068-1073
- **NEW APPROXIMATE BOUNDARY-CONDITIONS FOR LARGE EDDY SIMULATIONS OF WALL-BOUNDED FLOWS** *PHYSICS OF FLUIDS A-FLUID DYNAMICS*
Piomelli, U., Ferziger, J., Moin, P., Kim, J.

1989; 1 (6): 1061-1068

- **CHARACTERISTIC-EDDY DECOMPOSITION OF TURBULENCE IN A CHANNEL** *JOURNAL OF FLUID MECHANICS*
Moin, P., Moser, R. D.
1989; 200: 471-509
- **REYNOLDS-STRESS AND DISSIPATION-RATE BUDGETS IN A TURBULENT CHANNEL FLOW** *JOURNAL OF FLUID MECHANICS*
Mansour, N. N., Kim, J., Moin, P.
1988; 194: 15-44
- **KARHUNEN-LOEVE EXPANSION OF BURGERS MODEL OF TURBULENCE** *PHYSICS OF FLUIDS*
Chambers, D. H., Adrian, R. J., Moin, P., Stewart, D. S., Sung, H. J.
1988; 31 (9): 2573-2582
- **MODEL CONSISTENCY IN LARGE EDDY SIMULATION OF TURBULENT CHANNEL FLOWS** *PHYSICS OF FLUIDS*
Piomelli, U., Moin, P., FERZIGER, J. H.
1988; 31 (7): 1884-1891
- **EJECTION MECHANISMS IN THE SUBLAYER OF A TURBULENT CHANNEL** *PHYSICS OF FLUIDS*
Jimenez, J., Moin, P., Moser, R., Keefe, L.
1988; 31 (6): 1311-1313
- **STOCHASTIC ESTIMATION OF ORGANIZED TURBULENT STRUCTURE - HOMOGENEOUS SHEAR-FLOW** *JOURNAL OF FLUID MECHANICS*
Adrian, R. J., Moin, P.
1988; 190: 531-559
- **HELICITY FLUCTUATIONS IN INCOMPRESSIBLE TURBULENT FLOWS** *PHYSICS OF FLUIDS*
Rogers, M. M., Moin, P.
1987; 30 (9): 2662-2671
- **TURBULENCE STATISTICS IN FULLY-DEVELOPED CHANNEL FLOW AT LOW REYNOLDS-NUMBER** *JOURNAL OF FLUID MECHANICS*
Kim, J., Moin, P., Moser, R.
1987; 177: 133-166
- **THE STRUCTURE OF THE VORTICITY FIELD IN HOMOGENEOUS TURBULENT FLOWS** *JOURNAL OF FLUID MECHANICS*
Rogers, M. M., Moin, P.
1987; 176: 33-66
- **THE EFFECTS OF CURVATURE IN WALL-BOUNDED TURBULENT FLOWS** *JOURNAL OF FLUID MECHANICS*
Moser, R. D., Moin, P.
1987; 175: 479-510
- **EVOLUTION OF A CURVED VORTEX FILAMENT INTO A VORTEX RING** *PHYSICS OF FLUIDS*
Moin, P., Leonard, A., Kim, J.
1986; 29 (4): 955-963
- **THE STRUCTURE OF THE VORTICITY FIELD IN TURBULENT CHANNEL FLOW .2. STUDY OF ENSEMBLE-AVERAGED FIELDS** *JOURNAL OF FLUID MECHANICS*
Kim, J., Moin, P.
1986; 162: 339-363
- **THE STRUCTURE OF THE VORTICITY FIELD IN TURBULENT CHANNEL FLOW .1. ANALYSIS OF INSTANTANEOUS FIELDS AND STATISTICAL CORRELATIONS** *JOURNAL OF FLUID MECHANICS*
Moin, P., Kim, J.
1985; 155 (JUN): 441-464
- **APPLICATION OF A FRACTIONAL-STEP METHOD TO INCOMPRESSIBLE NAVIER-STOKES EQUATIONS** *JOURNAL OF COMPUTATIONAL PHYSICS*
Kim, J., Moin, P.
1985; 59 (2): 308-323

- **Numerical Simulation of Turbulent Flows** @book{ book3, title={Fundamentals of Engineering Numerical Analysis},publisher={Cambridge},year={2010},edition={2},volume={},series={},doi={},allauthors={},author={}} *Annual Rev. of Fluid Mech*
Parviz, M., Rogallo, R., S.
1984; 116: 99-137
- **A SPECTRAL NUMERICAL-METHOD FOR THE NAVIER-STOKES EQUATIONS WITH APPLICATIONS TO TAYLOR-COUETTE FLOW** *JOURNAL OF COMPUTATIONAL PHYSICS*
Moser, R. D., Moin, P., Leonard, A.
1983; 52 (3): 524-544
- **NUMERICAL INVESTIGATION OF TURBULENT CHANNEL FLOW** *JOURNAL OF FLUID MECHANICS*
Moin, P., Kim, J.
1982; 118 (MAY): 341-377
- **3-DIMENSIONAL TIME-DEPENDENT CALCULATION OF TURBULENT CHANNEL FLOW**
Moin, P., Kim, J.
AMER INST PHYSICS.1980: 1083-83
- **ON THE NUMERICAL-SOLUTION OF TIME-DEPENDENT VISCOUS INCOMPRESSIBLE FLUID-FLOWS INVOLVING SOLID BOUNDARIES** *JOURNAL OF COMPUTATIONAL PHYSICS*
Moin, P., Kim, J.
1980; 35 (3): 381-392
- **INVESTIGATION OF FLOW STRUCTURE IN THE WALL REGION OF TURBULENT BOUNDARY-LAYERS VIA A NUMERICAL-SIMULATION**
Kim, J., Moin, P.
AMER INST PHYSICS.1980: 1103-
- **LARGE EDDY SIMULATIONS OF TURBULENT CHANNEL FLOW**
Moin, P., Reynolds, W. C., FERZIGER, J. H.
AMER INST PHYSICS.1978: 989-89
- **PROGRESS IN LARGE EDDY SIMULATION**
FERZIGER, J. H., Reynolds, W. C., Moin, P., Mansour, N. N., Mehta, U. B.
AMER INST PHYSICS.1976: 1229-29