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Executive Summary

Dr. Lian-Ping Wang is currently Professor of Mechanical Engineering and Professor of Physical Ocean Science and Engineering at University of Delaware, and Chang Jiang Professor (Visiting) of the State Key Laboratory for Coal Combustion, Huazhong University of Science and Technology, Wuhan, China.

Dr. Wang received his B.S. in Mechanics from Zhejiang University, China in 1984, Ph.D. in Mechanical Engineering from Washington State University in 1990 and did post-doctoral work in turbulent dispersed flows at Brown University (with Prof. Martin Maxey), and then in turbulence physics at Pennsylvania State University (with Profs. Jim Brasseur and John Wyngaard). He joined University of Delaware as a faculty in 1994. Over the years, he held visiting appointments at Los Alamos National Lab, NASA Langley Research Center, Brown University, and National Center for Atmospheric Research in the US, and Chinese Academy of Sciences, Peking University, and Huazhong University of Science and Technology in China.

Dr. Wang uses advanced simulation tools and theoretical methods to study multiphase flows and transport in engineering applications and environmental processes. He is interested in studying fundamental physics in turbulent multiphase flows, as well as computational fluid dynamics (CFD) modeling of complex flows in industrial, natural, and biological systems. He is currently developing computational tools to study collision rates and growth of cloud droplets in atmospheric clouds and its impact on warm rain initiation. He also develops numerical methods to study complex fluid flow and transport in fuel cells and soil porous media, and transport and retention of colloids and nanoparticles in the subsurface environment.

Wang has published about 100 journal papers, primarily in the fluid mechanics journals such as J. Fluid Mech, Phys. Fluids, Annu. Rev. Fluid Mech., Phys. Rev. Lett., Int. J. Multiphase Flow, J. Atmos. Sci., and J. Comp. Phys. ISI gives Wang's citations as over 2,100 with an h-index of 24. In recent years, he has extended significantly his areas of research and his extent of international collaborations.

Dr. Wang's key research accomplishments include:

- During his PhD, he developed a theoretical model to predict turbulent dispersion of sedimenting inertial particles (J. Atmos. Sci. 50: 1897-1913) where he also developed an empirical correlation for the integral time scale of fluid velocity seen by an inertial particle. Now known as the Wang and Stock correction in the multiphase flow literature, this correlation has been used in popular commercial software packages such as FIDAP by Fluent, Inc.

- He was the first to rigorously derive the velocity correlations in a number of Lagrangian stochastic trajectory models (Atmos. Environ. 26: 1599-1607), which provided a theoretical foundation for improving these models to study turbulent diffusion in environmental applications.
- His postdoctoral work with Martin Maxey produced a seminal paper (J. Fluid Mech. 256: 27-68) in particle-laden turbulent flows. Using DNS, they discovered, for the first time, several effects of small-scale turbulence structure on particle transport, mixing, and settling velocity, including the Kolmogorov scaling of preferential concentration and preferential sweeping. This work motivated many experimental and theoretical follow-up studies on the same topic, as well as applications in such diverse fields as engineering, geophysics, aerosol science, and marine ecology.
- His postdoctoral work at Penn State led to a significant study related to Kolmogorov refined similarity (J. Fluid Mech. 309: 113-156) using then the highest-resolution DNS flows. He carefully measured many quantities related to the intermittency and scaling dynamics of fine-scale turbulence, and the results have served as a benchmark since then.
- In the last 15 years, his research focuses on turbulent collision rate and collision efficiency of inertial particles (J. Fluid Mech. 415: 117-153; J. Fluid Mech. 433: 77-104; J. Atmos. Sci. 62: 2433-2450; New. J. Phys. 10, 099802; Annu. Rev. Fluid Mech. 45:293-324). He is among the first to develop a theoretical foundation for the collision kernel, rigorous collision rate data from DNS, and an analytical parameterization of the turbulent collision kernel. They represent groundbreaking efforts to address a very difficult topic, and have now been used by many groups (e.g., Stevens in Germany, Nenes at George Tech, Cooper at NCAR, Noh in S. Korea) in the atmospheric science community to develop the next-generation weather forecast models.
- Another area of his recent work (*Langmuir,* 28: 12753-12761; *Langmuir*, 28:14681-14692, *J. Colloid and Interface Sci*.: 406: 44-50) concerns the transport and retention of colloids and nanoparticles in the environment. The work involves the effects of surface forces on these small particles and their interactions with each other and with the porous media grain surfaces. He has applied the lattice Boltzmann method to simulate the pore-scale complex flows and Lagrangian tracking of colloids to study multiscale reversible retention of colloids and NPs near grain surfaces. His work shows that the retention rate depends on several factors such as the mean flow speed, solution ionic strength, surface roughness and other surface heterogeneities.
- In the last five year, he started to develop particle-resolving simulation tool based on the lattice Boltzmann approach, in order to study turbulence modulation by finite-size solid particles (*Comp. & Math. with Appl.* 65:194-210 & 67: 363-380; *ASME J. Fluids Engr.* 128: 041103 & 041203). He showed that the pivot wavenumber between spectral attenuation and augmentation depends mainly on the particle size, but the characteristics of the size dependence changes when the particle size exceeds the Taylor microscale. Also the turbulence modulation in a channel laden with finite-size solid particles has many facets depends on spatial location and spatial direction of the flow.
- He has developed, for the first time, lattice-Boltzmann models using 2D rectangular or 3D cuboid lattices that are fully consistent with the Navier-Stokes equations (*Comp. & Math. with Appl.* 72: 288-310, 72:349-374; *J. Comp. Phys.* 326: 893-912). These models were derived rigorously from an inverse design approach where the hydrodynamic equations are used to constrain the lattice Boltzmann model details.

Dr. Wang's original contributions have been recognized through a number of honors and awards. He is a fellow of American Physical Society (elected in 2011) and a fellow of American Society of Mechanical Engineers (elected in 2016). He received Francis Alison Young Scholars Award from University of Delaware in 1998, Faculty Fellowship from National Center for Atmospheric Research in 2005, Distinguished Overseas Scholar Award from National Natural Science Foundation of China in 2006, and

Chang Jiang Chair Professorship from China's Ministry of Education in 2012. His papers on cloud microphysics have been recognized twice (2010, 2011) as *Top-50 Most Cited Articles in Atmospheric Research* by Elsevier Publisher.

During the last 20 years, Wang has delivered a total of 80 invited and keynote talks at many conferences, symposia, workshops, and as a seminar speaker at various universities and institutions across the world. In recent years, Dr. Wang has been invited to speak at a number of high-profile international workshops concerning cloud physics, weather prediction, and climate modeling, including Workshop *Physics of Climate Change* at Kavli Institute for Theoretical Physics, UC Santa Barbara (2008); International School and Workshop *Dynamics of Inertial Particles: From Ocean and Atmosphere to Planets* at Max-Planck Institute for Physics of Complex Systems in Germany (2008); The 4th IMS Turbulence Workshop on *Clouds and Turbulence* at Imperial College, London, UK (2009); The third International Workshop on *Next-Generation Numerical Weather Prediction Models: Bridging parameterization, explicit clouds and large eddies (2010) in South Korea,* International summer school on Fluctuation and turbulence in Cloud physics in France (2010), *New Directions in Turbulence* at the Kavli Institute for Theoretical Physics in China (2012), and Int. Workshop on Numerical Simulation of Particle/Droplet/Bubble-laden Multiphase Flows at Japan Agency for Marine-Earth Science and Technology (2013).

Specialty Areas: Turbulence, multiphase flow, simulation, collision-coalescence, hydrodynamic interaction, cloud microphysics, colloids, particle-resolved simulation, multiscale problems, and CFD modeling of complex flows.

Education

Ph.D. (1986–1990) in Mechanical Engineering from Washington State University, Pullman, Washington. Thesis: "On the dispersion of heavy particles by turbulent motion." Advisor: Professor David E. Stock.

M.S. Coursework (1984–1986) in Applied Mathematics and Engineering Mechanics from Zhejiang University, Hangzhou, Zhejiang, China.

B.S. (1980–1984) in Applied Mathematics and Engineering Mechanics from Zhejiang University, Hangzhou, Zhejiang, China.

Professional History

09/16 – 03/17	**Invitation Fellow** of Japanese Society for the Promotion of Science, worked for six months at Japanese Agency for Marine-Earth Science and Technology
06/14 – 05/17	**Affiliate Scientist**, National Center for Atmospheric Research (8/2014; 1/2015)
12/2012 –	**Chang Jiang Visiting Professor** Huazhong University of Science and Technology, China (12/2012-1/2013; 6-7/2013, 12/2013-1/2014, 5-7/2014, 12/2014-1/2015, 5-6/2015, 7-8/2015, 12/2015-1/2016, 7-8/2016)
2009 –	**Professor** of Mechanical Engineering College of Engineering, University of Delaware
2003 –	**Visiting Scientist**, National Center for Atmospheric Research

	(1-3/2003; 8/2004; 1/2005; 1/2006; 7-8/2006, 12/2006, 1/2007, 7-8/2007, 12/2007-1/2008, 7-8/2008, 1/2009, 7-8/2009, 1-2/2010, 6-7/2010, 1/2011, 7-8//2011, 1/2012, 8/2012, 1-2/2013, 7-8/2013, 1/2014)
2014 –	**Visiting Professor**, Yonsei University, South Korea (7/7/14-7/12/14)
7/11 – 6/17	**Joint Professor** of School of Marine Science and Policy, College of Earth, Ocean, and Environment, University of Delaware
10/10 – 9/13	**Joint Professor** of Biomedical Engineering Program College of Engneering, University of Delaware
2009 – 2012	Associate Director, Delaware Center for Study of Space Radiation Effects, University of Delaware
2009 – 2010	Visiting Professor, State Key Laboratory of Turbulence and Complex systems, College of Engineering, Peking University, China (9/2/09-10/10/09, 10/25/09-11/20/09, 12/7/09-1/10/10, 3/18/10-4/16/10)
2007 –	Associate Editor, *International Journal of Engineering Systems Modelling and Simulation*
3/2010	IBM Visiting Professor, Division of Applied Mathematics and Center for Fluid Mechanics, Turbulence and Computation, Brown University
10/2009 –	Affiliated Faculty Member The Delaware Environmental Institute, University of Delaware
2007 – 2009	Visiting Scientist, Laboratory for Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences (5-6/2007, 5-6/2008, 6-7/2009)
1/08 – 10/09	Affiliated Faculty Member Center for Critical Zone Research, University of Delaware
2001 – 2009	Associate Professor of Mechanical Engineering College of Engineering, University of Delaware
6/2005 to 9/2005	NCAR Faculty Fellow National Center for Atmospheric Research
1994 to 2001	Assistant Professor Mechanical Engineering, University of Delaware
6/2000 to 8/2000	Summer Faculty Researcher, NASA Langley Research Center
7/1998 to 8/1998	Visiting Scientist, Los Alamos National Laboratory
10/1992 to 8/1994	Research Associate Mechanical Engineering and Meteorology, The Pennsylvania State University
9/1990 to 9/1992	Visiting Research Associate

Applied Mathematics and Center for Fluid Mechanics, Brown University

8/1986 to 8/1990 Instructor/Teaching Assistant
Department of Mechanical and Materials Engineering, Washington State University

Research Interests

Dr. Wang uses advanced simulation tools and theoretical methods to study multiphase flows and transport in engineering applications and environmental processes. He is interested in studying fundamental physics in turbulent multiphase flows, as well as computational fluid dynamics (CFD) modeling of complex flows in industrial, natural, and biological systems. He is currently developing computational tools to study collision rates and growth of cloud droplets in atmospheric clouds and its impact on warm rain initiation. He also develops numerical methods to study complex fluid flow and transport in fuel cells and soil porous media. He also studies transport and retention of colloids and nanoparticles in the subsurface environment. Recently, he has developed a particle-resolving simulation tool to study turbulence modulation by finite-size particles.

Awards and Honors

ASME Fellow	American Society of Mechanical Engineers	2016
Invitation Fellow	Japan Society for the Promotion of Science	2016-2017
Affiliate Scientist	National Center for Atmospheric Research	2014-2017
Chang Jiang Chair Professor (Visiting)	China's Ministry of Education, through Huazhong University of Science and Technology, China	2012-present
Fellow of the American Physical Society	Division of Fluid Dynamics, American Physical Society	2011
Top-50 Most Cited Articles in Atmospheric Research	Elsevier Publisher	2011
Top-50 Most Cited Articles in Atmospheric Research	Elsevier Publisher	2010
Distinguished Overseas Young Investigator Award	National Natural Science Foundation of China	2006
NCAR Faculty Fellowship (One of the three inaugural NCAR Fellowships)	National Center for Atmospheric Research	2005
Francis Alison Young Scholars Award *(Awarded to one junior faculty per year)*	University of Delaware	1998
ASME Travel Award	ASME Fluids Engineering Division	1998
Outstanding Teaching Award	University of Delaware	1996
Teaching Assistantship / Instructor	Washington State University	1986-90

Other Honors

Keynote speaker	The Second International Workshop on Numerical Simulation of particle/droplet/bubble-laden multiphase flows, Earth Simulator Center, Yokohama, Japan	2016
Invited short-course lecturer	The 12th International Conference on Mesoscopic Methods in Engineering and Science (ICMMES 2015), Beijing, China	2015
Keynote speaker	International Workshop on Numerical Simulation of particle/droplet/bubble-laden multiphase flows, Earth Simulator Center, Yokohama, Japan	2013
Nominated for the Governing Board of the International Conference on Multiphase Flow (ICMF)	ICMF 2013, Jeju, Korea	2013
Nominated for Excellence in Teaching Award	University of Delaware	2012
Invited speaker, *Third International Workshop on Next-Generation NWP Models: Bridging parameterization, explicit clouds and large eddies*	Yonsei University, Seoul, South Korea	2010
Invited Lecturer at the International School on *Fluctuations and Turbulence in the Microphysics and Dynamics of Clouds*	Centre National de la Recherche Scientifique (CNRS), France	2010
Invited speaker for The 4th IMS Turbulence Workshop on *Clouds and Turbulence*	Imperial College, London, UK	2009
Invited Speaker and Lecturer for International School and Workshop on *Dynamics of Inertial Particles: From Ocean and Atmosphere to Planets*	Max-Planck-Institut Für Physik Komplexer Systems, Dresden, Germany	2008
Invited Speaker and Participant for Workshop *Physics of Climate Change*	Kavli Institute for Theoretical Physics UC Santa Barbara	2008
Nominated for Exemplary Use of Technology in Teaching Contest	University of Delaware	2006
Nominated for Excellence in Teaching Award	University of Delaware	2006

Professional Affiliations

Lifetime Fellow, American Physical Society (60006301; Member since 7/1/1990; Fellow since 11/2011; Lifetime Fellow since 7/2012);

Member, European Mechanics Society (EUROMECH) (EM 112116; member since 9/2011)

Member, American Society of Mechanical Engineers (5122148; Member since 3/24/2006)

Member, American Meteorological Society (0315592; Member since 2006)

Member, American Association of University Professors (Member since 9/1/1994)

Past Member: American Association for Aerosol Research, Society of Engineering Sciences.

Research Grants / Contracts

Pending Grants

1. Pending, NSF DMS 1723001, CDS&E: Development of a novel mesoscopic algorithm for rigorous simulation of compressible multiphase flows. PI. L.-P. Wang, co-PI: Xiaoming Li (UD ECE). Amount $300,000, from 6/1/2017 – 5/31/2020. Submitted on 12/9/2016.
2. Pending, NSF ACI 1713755, Bridging information gaps in turbulent particle-laden flows by petascale computing on Blue Waters. PI. L.-P. Wang, co-PI: Xiaoming Li (UD ECE). Amount $39,696 (travel support), from 5/1/2017 – 4/30/2019. Submitted on 11/9/2016.
3. Pending, NSF CBET 1709878, CDS&E: Deep computing and modeling of turbulent particle-laden flows on scalable heterogeneous computers. PI. L.-P. Wang, co-PI: Xiaoming Li (UD ECE). Amount $300,000, from 6/1/2017 – 5/31/2020. Submitted on 10/31/2016.
4. Pending, NSF CBET 1706070, Collaborative Research: Effects of finite-size solid particles on flow transition and turbulence in a circular pipe. PI. L.-P. Wang, co-PI: Orlando Ayala (Old Dominion University). Amount $226,651, from 6/1/2017 – 5/31/2020. Submitted on 10/20/2016.
5. Pending, NSF CBET 1706130, Multiscale plenoptic imaging and direct computation of turbulent channel flows laden with finite-size solid particles. PI. L.-P. Wang, co-PI: Jingyi Yu (UD CIS). Amount $300,000 (my portion $180,000), from 6/1/2017 – 5/31/2020. Submitted on 10/20/2016.

Active Grants at UD

1. NSF, CBET1546644, REU-Bridging Particle-Resolved and Point-Particle Based Simulation for Turbulent Particle-Laden Flow Using New Heterogeneous High-Performance Computer. PI. L.-P. Wang. Amount $6,000, from 6/1/2016-8/31/2017.
2. NSF CNS1513031: II-NEW: Acquisition of Time-Dependent 3D Transparent Flows via Light Field Imaging and Displays. Jingyi Yu (PI), co-PI: L-P Wang. Amount $174,445, from 6/15/2015 – 6/15/2017.
3. NSF AGS-1139743, Collaborative Research: Integrating models and observations to assess effects of turbulence on warm rain initiation (PIs Patrick Chung - UCSC, Lian-Ping Wang - UD). Amount $595,799 = $330,891 (UCSC) + $264,908 (UD), from 10/1/2012 to 9/30/2017.
4. NSF CBET-1235974, Bridging particle-resolved and point-particle based simulation for turbulent particle-laden flow using new heterogeneous high-performance computer (PI: L.-P. Wang; co-PIs, O. Ayala, Xiaoming Li; Collaborators: Guodong Jin of Chinese Academy of Sciences, David Richter, National Center for Atmospheric Research). Amount $359,861, from 9/1/2012 to 8/31/2017.

Active International Collaboration Projects

1. National Natural Science Foundation of China (Grant No. 11372275): Fully-resolved numerical simulations of particle-laden turbulent channel flows (PI: Prof. Zhaosheng Yu, Zhejiang

University; International collaborator: Lian-Ping Wang). Amount: ¥760,000, from 01/01/2014 to 12/31/2017.

2. National Natural Science Foundation of China (Grant No. 11272196): Laboratory study on cloud/haze-clear air interfacial turbulent mixing and its interaction with particles (PI: Professor Zhiming Lu, Shanghai University; International collaborator: Lian-Ping Wang). Funding Amount: ¥820,000 from 10/10/2013 to 12/31/2016.
3. National Natural Science Foundation of China (Grant No. 11332006): Study of large-scale structures on their transport characteristics in complex turbulent systems (PI: Professor Yulu Liu, Shanghai University; International collaborator: Lian-Ping Wang). Funding Amount: ¥3,150,000 from 01/01/2014 to 12/31/2018.

Previous Grants

1. Foundation of State Key Laboratory of Coal Combustion, Huazhong University of Science and Technilogy, China: Developing rigorous tools to simulate compressible turbulent particle-laden flows. PI: L.-P. Wang; co-PI: Zhaoli Guo. Amount: ¥100,000, from 1/1/2015 to 12/31/2015.
2. Department of Mechanical Engineering, University of Delaware Seed Fund: Development of a novel mesoscopic scheme for compressible multiphase flows. PI L-P Wang, Amount $25,000, 6/2015-5/2016, MEEG17s000.
3. Foundation of State Key Laboratory of Coal Combustion: Developing rigorous tools to simulate compressible turbulent particle-laden flows. PI: Lian-Ping Wang, co-PI: Zhaoli Guo. Amount: ¥100,000 from 1/2015 to 12/2015.
4. AFOSR FA9550-13-1-0213, Architecture and Programming Models for High Performance Interactive Computation. PI: Xiaoming Li; co-PIs: G.R. Gao and Lian-Ping Wang; collaborator: Jack B. Dennis (MIT). Amount $1,351,504, from 10/1/2013-3/30/2016, Wang's portion is $224,882.
5. NSF CRI 0958512, II-New: System Acquisition for the Development of Scalable Parallel Algorithms for Scientific Computing (PI: S F Siegel; co-PIs: P B Monk, D M Swany, K Szalewicz; Senior Investigators: T.J. Hsu, J.T. Kirby, A.D. Kirwan, B L Lipphardt, B K Nikolic, L F Rossi, K Sarkar, B.D. Saunders, L-P Wang), $749,769 from 05/01/2010 – 04/30/2013.
6. National Natural Science Foundation of China (Grant No. 11072247): The interaction between particle and turbulent flows in a vertical channel with a rough wall (PI: Guodong Jin of The State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences; co-PI: Wang). Amount: ¥380,000 from 1/2011 to 12/2013.
7. National Natural Science Foundation of China (Grant No. 11072217): Studies of particle-fluid interactions in pipe and duct (PI: Prof. Zhaosheng Yu, Zhejiang University; International collaborator: Lian-Ping Wang). Amount: ¥400,000, from 01/01/2011 to 12/31/2013.
8. NSF CBET-0932686: Theoretical and experimental study of transport and retention of nanoparticles through subsurface porous media (PI: L.-P. Wang, co-PI: Yan Jin), $330,005 from 9/1/2009 to 8/31/2013, Wang's portion $177,429.
9. NSF OCI-0904534 / 0904449: Collaborative Research: PetaApps: Enabling Multiscale Modeling of Turbulent Clouds on Petascale Computers (PIs: L.-P. Wang-UD and W.W. Grabowski-NCAR, co-PIs: Guang Gao, Chandra Kambhamettu, Xiaoming Li, Louis Rossi, A. Wyszogrodzki-NCAR). Amount $1,064,500 to UD and $300,000 to NCAR from 9/1/2009 to 8/31/2013.

10. JHU Applied Physics Lab contract, Towards a new modeling framework for simulating compressible particle-laden turbulent flows (PI: L-P Wang; co-PI: O Ayala), $9,001 from 05/01/2013 – 07/15/2013.
11. JHU Applied Physics Lab contract, Towards a new modeling framework for simulating compressible particle-laden turbulent flows (PI: O. Ayala; co-PI: L-P Wang), $55,000 from 10/01/2011 – 08/31/2012.
12. NASA EPSCoR: Development of a Delaware Center for Study of Space Radiation Effects: An EPSCoR research and education initiative (PI: W.H. Matthaeus of Physics and Astronomy, co-Is: D.J. Mullan, P. Evenson, J.C. Kasper, J. Clem, J.W. Bieber, L-P. Wang, P. Spampinato). Amount: $750,000 from 1/1/2009-12/31/2011.
13. USDA National Research Initiative Award (NRI-2008-02803): Effects Of 3-D Pore-Scale Flow Geometry and Surface Heterogeneity On Colloid Transport In Porous Media (PI: Y. Jin of Plant and Soil Sciences, co-PI: Wang). Amount: $243,000 from 9/2008-8/2011.
14. NSF ATM-0730766: Collaborative research: Turbulence enhanced droplet growth by collision-coalescence [PI: Wang (UD) and A. Aliseda (U. Washington), co-PI: W.W. Grabowski (NCAR)]. Amount: $534,186 from 12/1/2007 to 11/30/2011, Wang's portion is $208,505.
15. NSF ATM-0527140: Turbulent collision-coalescence of cloud droplets and its impact on warm rain formation (PI: Wang, co-PI: W.W. Grabowski). Amount: $522,701 from 8/2005 to 7/2010.
16. National Natural Science Foundation of China (Project No. 10628206): Multi-scale approach for turbulent collision-coalescence of cloud droplets in warm rain process (PI: Wang; Collaborator and co-PI: Dr. Guowei He, Director of The State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences). Amount: ¥400,000 from 1/2007 to 12/2009.
17. USDA National Research Initiative Award (NRI-2006-02551): Colloid interfacial reactions in open microchannel representing unsaturated soil capillaries (PI: Y. Jin; co-PI: Wang). Amount: $96,001 from 9/2006 to 8/2008.
18. Schlumberger Technology Corporation, Texas: Simulating Fiber-in-Liquid Flows for DTS Technology with Lattice-Boltzmann Method (PI: Wang). Amount $56,001 from 8/2007-6/2009.
19. NCAR GTP/MMM Visitor Programs: Short-term visit support. Amount: $8,700 from January 2007 and summer 2007.
20. NCAR GTP Visitor Program: Short-term visit support. Amount: $3,654 from July to August 2006.
21. NCAR MMM Visitor Program: Short-term visit support. Amount: $2000, January, 2006.
22. NCAR (National Center for Atmospheric Research): Faculty Fellowship award. Amount: $27,014 from June to August 2005.
23. DOE: Fuel cell research at the University of Delaware (PIs: S.G. Advani and J. Chen, I am one of 8 co-PI's). Amount: $966,000 from 6/2004 to 10/2005, Wang's portion is $75,070.
24. NCAR MMM Visitor Program: Short-term visit support. Amount: $2000, January, 2005.
25. NCAR MMM Visitor Program: Short-term visit support. Amount: $3500, August, 2004
26. NSF ATM-0114100: Effects of turbulence on the collision-coalescence growth of cloud droplets (PI: Wang, co-PI: W.W. Grabowski). Amount: $289,739 from 6/2001 to 8/2005.
27. NCAR MMM Visitor Program: Long-term visit support. Amount: $7,000, January to March, 2003.

28. The Solarc Group: Vertical solar blinds. Amount: $11,000 from 9/2001 to 10/2002.
29. DOE / REL: Seed grant for participation in the Solar Decathlon". Amount: $5,000 from 7/2001-10/2002.
30. Sustainable Development Fund: The Solar Decathlon project at the University of Delaware - Efficient use of solar energy in residential homes. Amount: $25,000 from 2/2002 to 10/2002.
31. State of Delaware Energy Office: UD Solar Decathlon. Amount: $5,000 from 7/2001 to 10/2002.
32. Dupont Center for Collaborative Research and Education: Solar Decathlon. Amount: $10,000 from 7/2001 to 10/2002.
33. NSF MRI ATM-9977692: Acquisition of an Avalon-Boewulf cluster and development of discipline specific parallel research tools (PI: W.H. Matthaeus, one of the 13 co-I's). Amount: $500,000 from 10/1999 to 9/2002.
34. Institute of Energy Conversion, University of Delaware: Source modeling during thin Film Production. Amount $25,000 from 9/1/2000 to 8/31/2001.
35. Dupont Educational Aid Grant: Fine particle technology. Amount: $3,000 (unrestricted gift), 6/1999.
36. Dupont Educational Aid Grant: Simulation of gas-liquid flows. Amount: $8,000 (unrestricted gift), 6/2000.
37. NASA Langley: Comparison of spectral method and lattice-Boltzmann approach for turbulence simulation on a Beowulf cluster, Amount: $16,500, 6-8/2000.
38. Conectiv Power Delivery: CFD modeling of flows around combustion turbine exhaust structure. Amount: $35,845 from 6/1999 to 5/2000.
39. Los Alamos National Lab: High-resolution simulations and scaling similarities of turbulence, Amount: $10,000, 8/1998.
40. Los Amalos National Lab: Lattice-Boltzmann simulations of multiphase flows. Graduate Assistantship at $150,000 from 1/1/1997 to 12/31/1999.
41. IBM T.J. Watson Research Center and The State of Delaware: The effect of local hydrodynamic interactions on particle coagulative growth. Amount: $60,000 from 12/1996 to 6/1998.
42. University of Delaware Research Foundation: Lattice Boltzmann method for multiphase flows with phase transition. Amount: $30,000 from 6/1996 to 5/997.
43. IBM T.J. Watson Research Center: High performance simulations of complex turbulent flows. Amount: $55,000 (plus $30,000 matching from University of Delaware) from 1/1996 to 2/1997.
44. NIH SBIR Phase I: Air flow characterization in the pharynx and its relation to sleep apnea (Subcontract from Anatek Corp, with Santare, Prasad & Szeri). Amount: $51,330 from 10/1995 to 11/1996.
45. University of Delaware Research Foundation: Effects of turbulence microstructures on coagulational growth of cloud droplets. Amount: $29,831 from 6/1995 to 5/1996.

Computing Resources Awards

1. 5/12/2016: NCAR CISL P35751014, Yellowstone large allocation award, "Turbulent Collision Statistics of Hydrodynamically Interacting Droplets Simulated by a Multiscale Approach", PI Wang, 3.2M core-hours awarded (total under this account now is 6.71M core hours), 11/1/2012 - 9/31/2017.

2. 5/12/2016: NCAR UDEL0001, Yellowstone large allocation award, "Study of flow modulation by finite-size particles using high-resolution particle-resolved simulations", PI Wang, co-PI O. Ayala, 1.9M new core-hours awarded (total under this account now 9.3M core hours), 11/1/2012 - 8/31/2017.
3. 10/27/2014: NCAR CISL P35751014, Yellowstone large allocation award, "Turbulent Collision Statistics of Hydrodynamically Interacting Droplets Simulated by a Multiscale Approach", PI Wang, 1,500,000 core-hours awarded (total under this account now is 3.51M core hours), 11/1/2012 - 9/31/2016.
4. 10/27/2014: NCAR UDEL0001, Yellowstone large allocation award, "Study of flow modulation by finite-size particles using high-resolution particle-resolved simulations", PI Wang, co-PI O. Ayala, 4M new core-hours awarded (total under this account now 7.4M core hours), 11/1/2012 - 8/31/2016.
5. 8/31/2014: NCAR UDEL0001, Yellowstone large allocation award, "Study of flow modulation by finite-size particles using high-resolution particle-resolved simulations", PI Wang, co-PI O. Ayala, 200,000 new core-hours awarded (total under this account now 3.4M core hours), 11/1/2012 - 8/31/2015.
6. XSEDE ATM130019, "Turbulent collision statistics of hydrodynamically interacting droplets simulated by a multiscale approach", PI Wang, co-PI O. Ayala, on TACC Dell PowerEdge C8220 Cluster with Intel Xeon Phi coprocessors (Stampede): 4,000,000 core-hours, Apr 01, 2013-March 31, 2014.
7. XSEDE ATM130013, Stampede startup allocation, "Turbulent collision statistics of hydrodynamically interacting droplets simulated by a multiscale approach", PI Wang, co-PI O. Ayala, 100,000 core-hours, January 13, 2013 – January 13, 2014.
8. NCAR UDEL0001, Yellowstone large allocation award, "Study of flow modulation by finite-size particles using high-resolution particle-resolved simulations", PI Wang, co-PI O. Ayala, 2,000,000 core-hours, 11/1/2012 - 8/31/2015.
9. NCAR CISL P35751014, Yellowstone large allocation award, "Turbulent Collision Statistics of Hydrodynamically Interacting Droplets Simulated by a Multiscale Approach", PI Wang, co-PI O. Ayala, 2,000,000 core-hours, 11/1/2012 - 8/31/2013.
10. NCAR ASD (Accelerated Scientific Discovery) award ASAP0001, Project Title - PetaScale Simulation of Physics and Dynamics of Turbulent Clouds, PIs: W.W. Grabowski (NCAR), and L.-P. Wang (UD); co-PIs: Andrzej Wyszogrodzki (NCAR), Zbigniew Piotrowski (NCAR), Orlando Ayala (UD), 6,250,000 core-hours on Yellowstonem 2013.
11. XSEDE ATM120014: Numerical Experiments of Physics and Dynamics of Multiscale Turbulent Clouds. Awarded 200,000 SUs on Kraken, January 24, 2012 – July 24, 2013.
12. NCAR CISL-35751017: Computing Resources Request for "Simulations of transport and retention of nanoparticles through subsurface porous media". Awarded 30,000 GAUs (General Accounting Units) on NCAR's supercomputers from 12/13/2011 to 8/31/2012. Cumulative total 465,000 GAUs.
13. NCAR CISL-35751014: Computing Resources Request for "Enabling Multiscale Modeling of Turbulent Clouds on Petascale Computers". Awarded 240,000 GAUs (General Accounting Units) on NCAR's supercomputers from 10/15/2009 to 7/31/2012. Cumulative total 465,000 GAUs.
14. NCAR CISL-35751015: Computing Resources Request for "Collaborative Research: Turbulence Enhanced Droplet Growth by Collision-Coalescence". Awarded 152,000 GAUs (General

Accounting Units) on NCAR's supercomputers from 7/8/2010 to 11/30/2011. Cumulative total 168,000 GAUs.

15. NCAR CISL-35751014: Computing Resources Request for "Enabling Multiscale Modeling of Turbulent Clouds on Petascale Computers". Awarded 225,000 GAUs (General Accounting Units) on NCAR's supercomputers from 10/15/2009 to 7/31/2012.
16. NCAR CISL-35751015: Computing Resources Request for "Collaborative Research: Turbulence Enhanced Droplet Growth by Collision-Coalescence". Awarded 16,000 GAUs (General Accounting Units) on NCAR's supercomputers from 7/8/2010 to 11/30/2010.
17. NCAR CISL-35751010: Computing Resources Request for "Turbulent collision-coalescence of cloud droplets and its Impact on Warm Rain Formation." Awarded additional 250,000 GAUs (General Accounting Units) on NCAR's supercomputers from 10/15/2008 to 7/31/2010, cumulative 276,000 GAUS.
18. NCAR CISL-35751010: Computing Resources Request for "Turbulent collision-coalescence of cloud droplets and its Impact on Warm Rain Formation." Awarded additional 8,000 GAUs (General Accounting Units) on NCAR's supercomputers from 7/15/2008 to 7/31/2009, cumulative 26,000 GAUS.
19. NCAR CISL-35751010: Large Computing Resources Request for "Turbulent collision-coalescence of cloud droplets and its Impact on Warm Rain Formation." Awarded 10,000 GAUs (General Accounting Units) on NCAR's supercomputers from 9/2007 to 7/2008, cumulative 18,000 GAUS.
20. NCAR SCD-35751010: Large Computing Resources Request for "Computational studies of turbulent collision-coalescence of cloud droplets." Awarded 8,000 GAUs (General Accounting Units) on NCAR's supercomputers from 9/2005 to 9/2007.

Teaching Grants

1. Honors Course Enrichment Funds $1,000 from the UD Honors Program, used for MEEG341 honors students to develop "quantitative" thermodynamics demonstrations.
2. ASHRAE: Undergraduate senior project grant: Solar domestic hot water system for the UD solar house. Amount: $5000, from 11/2001 to 10/2002.
3. Center for Teaching Effectiveness, University of Delaware: Real-world problem-based learning in the engineering classroom using commercial software packages and computer technology. Amount: $2,000 from 6/1999 to 5/2000.

Publications

Peer-reviewed journal articles (ISI Citation Databases, over 2,970 citations with h-index of 28 (*i.e.*, at least 28 papers have been cited 28 or more times, as of 1/4/2017); Google Scholar: 4,569 citations with h-index of 36 (as of 1/4/2017).

Under review

1. Tao S, Guo ZL, Wang L-P, 2016, Numerical simulations of multiple slippery spheres settling in a Newtonian fluid. *Powder Technology*, submitted on Sept. 27, 2016.
2. Geneva N, Peng C, Li XM, Wang L-P, 2016, An efficient scalable implementation of interface-resolved direct numerical simulation of turbulent particle-laden channel flow. *Parallel*

Computing, submitted.

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5. Bo YT, Wang P, Guo ZL, Wang L-P, 2016, Parallel implementation and validation of DUGKS for three-dimensional Taylor-Green vortex flow and turbulent channel flow, *Computers & Fluids, submitted.*
6. Lin, Zhaowu; Shao, Xueming; Yu, Zhaosheng; Wang, L-P, 2016, Effects of particle inertia on the interactions between the turbulent channel flow and the finite-size particles. *Physics of Fluids*, submitted.
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10. Wang L-P, Min HD, Peng C, Geneva N, Guo ZL, 2017, A lattice-Boltzmann scheme of the Navier-Stokes equation on a three-dimensional cuboid lattice. *Computers & Mathematics with Applications*. Accepted. doi: 10.1016/j.camwa.2016.06.017
11. Haoda Min, Peng C, Guo ZL, Wang L-P, 2017, An inverse design analysis of mesoscopic implementation of non-uniform forcing in MRT lattice Boltzmann models, *Computers & Mathematics with Applications*, in press. doi: 10.1016/j.camwa.2016.04.040
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13. Lin, ZW, Shao XM, Yu ZS, and Wang L-P, 2017, Effects of finite-size heavy particles on the turbulent flows in a square duct. *Journal of Hydrodynamics*, in press.

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38. L.-P. Wang, O. Ayala, H. Parishani, B. Rosa, W. W. Grabowski, A. A. Wyszogrodzki, 2012, Parameterization of turbulent collision statistics of cloud droplets, 16th International Conference on Clouds and Precipitation, July 30-August 3, 2012, Leipzig, Germany.
39. B. Rosa, H. PArishani, O ayala, L-P Wang, WW Grabowski, 2012, High-resolution simulation results of kinematic and dynamic collision statistics of cloud droplets, 16th International Conference on Clouds and Precipitation, July 30-August 3, 2012, Leipzig, Germany.
40. A. Aliseda, C. Bateson, O. Ayala, H. Parishani, L-P Wang, B. Rosa, 2012, Experimental and numerical investigation of droplet preferential concentration due to turbulence and its influence on droplet collisions and growth, 16th International Conference on Clouds and Precipitation, July 30-August 3, 2012, Leipzig, Germany.
41. W. W. Grabowski, A. A. Wyszogrodzki, L. - P. Wang, O. Ayala, 2012, Toward the assessment of the role of cloud turbulence in warm-rain development, 16th International Conference on Clouds and Precipitation, July 30-August 3, 2012, Leipzig, Germany.
42. W. W. Grabowski, A. A. Wyszogrodzki, J. Slawinska, D. Jarecka, H. Pawlowska, and L.-P. Wang, 2012, Modeling warm-rain microphysics and dynamics-microphysics interactions with EULAG-based large-eddy simulation model, 3rd International EULAG Workshop on Eulerian/Lagrangian methods for fluids. 25-28 June, 2012, Loughborough. UK.
43. Bogdan Rosa, Alberto Aliseda, Colin Bateson, Dr. Orlando Ayala, Hossein Parishani and Lian-Ping Wang, Numerical and experimental investigation of cloud droplet collision-coalescence, European Geosciences Union General Assembly, Vienna, Austria, April 22-27, 2012.
44. W.W. Grabowski, L.-P. Wang, A.A. Wyszogrodzki and O. Ayala, Toward the assessment of the role of cloud turbulence in warm-rain processes, European Geosciences Union General Assembly, Vienna, Austria, April 22-27, 2012.
45. Q. Qiu, H. Gao, J. Han, Y. Jin, L.-P. Wang, H16.00006, Micro-scale flow simulation and colloid transport modeling in saturated porous media. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
46. J. Wang, X. He, Y. Shi, L.-P. Wang, Z. Xiao, S. Chen, G6.00010, Scaling and statistics in three-dimensional compressible turbulence. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.

47. A. Aliseda, O. Ayala, H. Parishani, L.-P. Wang, B. Rosa, E21.00004, Experimental and Numerical investigation of a droplet-laden turbulent flow: preferential concentration due to turbulence and its influence on droplet collisions and growth. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
48. H. Parishani, O. Ayala, L.-P. Wang, B. Rosa, W. Grabowski, E21.00005, Highly scalable parallel implementation of turbulent collision of aerodynamically interacting cloud droplets. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
49. L.-P. Wang and W. Grabowski, E21.00006 The effect of dissipation intermittency on the turbulent collision statistics of cloud droplets. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
50. O. Ayala, C. Andersen, H. Parishani, L.-P. Wang, A12.00003. Methods and issues for highly-scalable simulation of isotropic homogeneous turbulence. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
51. H. Gao, O. Ayala, L.-P. Wang, D24.00003 The effect of particle size on the dynamics of a solid particle in a turbulent carrier flow. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
52. C. Andersen, O. Ayala, H. Gao, L.-P. Wang, D24.00004, Highly-scalable simulation of turbulent and particle-laden flows using the lattice Boltzmann approach. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
53. G.X. Shi, Y. Jin, V. Lazouskaya, C. Wang, and L.-P. Wang, R26.00008 Lattice Boltzmann simulation of electrostatic double layer interaction force for nanoparticles. APS Division of Fluid Dynamics 64th Annual Meeting, Baltimore, MD, November 20-22, 2011.
54. W.W. Grabowski, L.-P. Wang, A.A. Wyszogrodzki and O. Ayala, "Toward cloud-model assessment of the role of cloud turbulence in warm-rain development", Symposium on Nonlinear Processes in Geosciences, European Geosciences Union General Assembly, Vienna, Austria, April 3-8, 2011.
55. Zhou, X; Wang, L-P; Wang, L, Simulation on solute convection in a fiber-filled bone canaliculus with LBM and Monte-Carlo method. The annual meeting of the Orthopedic Research Society, 2010.
56. W.W. Grabowski, A. Wyszogrodzki, L.-P. Wang, O. Ayala, and B. Rosa, Toward cloud-model assessment of the role of cloud turbulence in warm-rain development. 13th AMS Conference on Cloud Physics, 28 June – 2 July, 2010, Portland, Oregon.
57. L.-P. Wang, B. Rosa, H. Parishani, O. Ayala, W.W. Grabowski, High-resolution hybrid direct numerical simulation of turbulent collision of cloud droplets. 13th AMS Conference on Cloud Physics, 28 June – 2 July, 2010, Portland, Oregon.
58. C. Bateson, W.W. Grabowski, H. Parishani, B. Rosa, L.-P. Wang, and A. Aliseda, Comparison of experimental and numerical studies of inertial droplets in turbulence: a possible mechanism for accelerated droplet size spectrum broadening. 13th AMS Conference on Cloud Physics, 28 June – 2 July, 2010, Portland, Oregon.
59. W.W. Grabowski and L.-P. Wang, 2010, Numerical Modeling of multiscale atmospheric flows: From cloud microscale to climate. Fifth European Conference on Computational Fluid Dynamics (ECCOMAS CFD 2010), June 14-17, 2010, Lisbon, Portugal.
60. L.-S. Luo, Y. Peng, W. Liao, L.-P. Wang, 2010, Lattice Boltzmann and pseudo-spectral methods for decaying turbulence. APS 2010 March meeting, Portland, Oregon, March15-19, 2010.

61. L.-P. Wang, H. Parishani, B. Rosa, C. Bateson, A. Aliseda, W.W. Grabowski, BS.00004, Simulated statistics of polydisperse sedimenting inertial particles in a turbulent flow under experimental conditions. APS Division of Fluid Dynamics 62nd Annual Meeting, Minneapolis, Minnesota, November 22-24, 2009.
62. C. Bateson, A. Molina, A. Aliseda, H. Parishani, L.-P. Wang, W.W. Grabowski, AS.00004, Experimental study of the effect of turbulence on the dynamics of sedimenting inertial particles. APS Division of Fluid Dynamics 62nd Annual Meeting, Minneapolis, Minnesota, November 22-24, 2009.
63. H. Gao and L.-P. Wang, GL.00002, Simulation of turbulent flow laden with finite-size spherical particles. APS Division of Fluid Dynamics 62nd Annual Meeting, Minneapolis, Minnesota, November 22-24, 2009.
64. L.-P. Wang, Turbulent collision-coalescence of cloud droplets: Recent advances and open issues. ASME Forum on Multiphase Processes in Geophysical and Environmental Flows in Vail, CO, August 2-5, 2009.
65. L.-P. Wang, 2009, Simulating preferential and unstable flows in porous media with lattice Boltzmann approach, Preferential and Unstable Flow in Porous Media - From Water Infiltration to Gas Injection, 29 March 2009 to 3 April 2009 on Monte Verità, Switzerland.
66. L.-P. Wang, 2009, Turbulent collision-coalescence of cloud droplets and its impact on warm rain initiation, The 4th IMS Turbulence Workshop on *Clouds and Turbulence,* Imperial College, London, March 23-25, 2009.
67. Lian-Ping Wang, Hui Gao, Charmaine Q. Qiu, and Yan Jin, 2009, Simulation of Viscous Flow and Colloid Transport in Saturated Soil Porous Media, SIAM Conference on Computational Science and Engineering (CSE09), March 2-6, 2009, Miami Hilton Hotel, Miami, Florida.
68. H. Gao and L.-P. Wang, MV.00004 Simulation of suspension flow of finite-size spherical particles in a 3D square channel. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.
69. L.-S. Luo, Y. Peng, W. Liao, and L.-P. Wang, PB.00005 Lattice Boltzmann and Pseudo-Spectral Methods for Decaying Turbulence. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.
70. H. Parishani, B. Rosa, L.-P. Wang, W. Grabowski, GQ.00001: Effect of large-scale flow forcing scheme on turbulent collision statistics of inertial particles. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.
71. B. Rosa, H. Parishani, L.-P. Wang, W. Grabowski, GQ. 00002: High-resolution direct numerical simulations (DNS) of turbulent collision of inertial particles. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.
72. L.-P. Wang, H. Gao, L.-S. Luo, Y. Peng, K.M. Yeo, M.R. Maxey, HQ.00002: Comparing particle-resolved simulation methods for moving particles in a viscous fluid. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.
73. C. Qiu, H. Gao, D. Fan, Y. Jin, L.-P. Wang, ME.00001: Three-dimensional micro-scale flow simulation and colloid transport modeling in saturated soil porous media. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.

74. G. Shi, V.I. Lazouskaya, Y. Jin, L.-P. Wang, ME.00002 : Numerical simulation of micro-scale flow and colloid transport near air-water interface in unsaturated porous media. APS Division of Fluid Dynamics 61st Annual Meeting, San Antonia, Texas, November 23-25, 2008.

75. Fan, D., H. Gao, L-P. Wang, and Y. Jin. Three-dimensional visualization and modeling of colloid transport under unfavorable conditions. July 13-18, 2008. Gordon Research Conference. Oxford, UK.

76. V. Lazouskaya, G.X. Shi, L-P Wang, and Y. Jin. Effect of hydrodynamics on colloid retention investigated at the pore scale. GSA-SSSA-ASA-CSSA Joint Meeting, October 5-10, 2008, Houston, TX.

77. V. Neacsu, L.P. Wang, and S.G. Advani, Lattice Boltzmann Method for microflow analysis in liquid composite molding. 9th International Conference on Composite Materials, Montréal, Quebec, Canada, July 8-10, 2008.

78. M.H. Du and L.-P. Wang, Application of LBE Method in Fiber-in-Liquid Flows for Downhole Pumpable Fiber Optic DTS Technology, *International Conference on Applied Mathematics: Modeling, Analysis and Computation.* June 1-5, 2008, Hong Kong.

79. L.-P. Wang, Direct Numerical Simulation of Particle-Laden Flows, *International Conference on Applied Mathematics: Modeling, Analysis and Computation.* June 1-5, 2008, Hong Kong.

80. V. Lazouskaya, Shi, G.X., L-P Wang, and Y. Jin. Effect of hydrodynamics on colloid retention in unsaturated pore-scale experiments. The 82nd Colloid and Surface Science Symposium. American Chemical Society, June 15-18, 2008, North Carolina State University.

81. D. Fan, H. Gao, L-P. Wang, and Y. Jin. Three-dimensional visualization and modeling of colloid transport in saturated porous media. The 82nd Colloid and Surface Science Symposium. American Chemical Society, June 15-18, 2008, North Carolina State University.

82. L.-P. Wang, W.W. Grabowski, The role of cloud turbulence in warm rain initiation. *European Geosciences Union General Assembly 2008***,** Vienna, Austria, 13 – 18 April 2008.

83. B. Rosa, L.-P. Wang, and W.W. Grabowski, AP.00007: An efficient representation of hydrodynamic interaction of cloud droplets and its application to collision efficiency. APS Division of Fluid Dynamics 60th Annual Meeting, Salt Lake City, Utah, November 18-20, 2007.

84. H. Gao, J. Han, Y. Jin, and L.-P. Wang, AQ.00005: Comparing two methods of simulating mirco-scale viscous flows in a porous channel, APS Division of Fluid Dynamics 60th Annual Meeting, Salt Lake City, Utah, November 18-20, 2007.

85. G. Shi, V. Lazouskaya, Y. Jin, and L.-P. Wang, BT.00004: Simulating gas-liquid flow in a micro-channel with the lattice Boltzmann method. APS Division of Fluid Dynamics 60th Annual Meeting, Salt Lake City, Utah, November 18-20, 2007.

86. L.-P. Wang, B. Rosa, S. Johnson, and W.W. Grabowski, Kinematic collision statistics in a turbulent suspension of sedimenting inertial droplets. *XXIV General Assembly of The International Union of Geodesy*, Perugia, Italy, July 2 to July 6, 2007.

87. B. Rosa, L.-P. Wang, and W.W. Grabowski, Modeling short-range interactions in a hybrid simulation of turbulent collision of cloud droplets. *XXIV General Assembly of The International Union of Geodesy*, Perugia, Italy, July 2 to July 6, 2007.

88. L.-P. Wang, S. Merkler, and W.W. Grabowski, Effects of turbulent collision kernel and initial size dispersion on rain initiation. *XXIV General Assembly of The International Union of Geodesy*, Perugia, Italy, July 2 to July 6, 2007.

89. H. Gao and L.-P. Wang, A fully resolved simulation method for turbulent collision of cloud droplets. *XXIV General Assembly of The International Union of Geodesy*, Perugia, Italy, July 2 to July 6, 2007.

90. Jie Han, Hui Gao, Lian-Ping Wang, Yan Jin, Numerical Investigation of Colloid Retention and Transport in Saturated Porous Media, The 81 Colloud and Surface Science Symposium, ACS Division of Colloid and Surface Science, June 24-27, 2007, University of Delaware, Newark, Delaware.

91. Lazouskaya, V., Shi, G.X., L-P Wang, and Y. Jin. Imaging and modeling of colloid processes in unsaturated pore experiments. AGU Fall Meeting, San Francisco, CA. December 10-14, 2007.

92. J. Han, H. Gao, L-P. Wang, and Y. Jin. Microscale modeling and experiments of colloid transport in porous media. ASA-CSSA-SSSA International Annual Meetings, New Orleans, LA, November 4-8, 2007.

93. W.W. Grabowski, L.-P. Wang, and P. Vaillancourt, "Impact of cloud turbulence on growth of cloud droplets", Symposium on Nonlinear Processes in Geosciences, European Geosciences Union General Assembly, Vienna, Austria, April 15-20, 2007 (invited presentation).

94. G.-W. He, Y. Yang, J. Zhang, and L.-P. Wang, "Subgrid scale contributions to Lagrangian time correlations in isotropic turbulence," APS Division of Fluid Dynamics 59th Annual Meeting, Tampa Bay, Florida, November 19-21, 2006.

95. O. Ayala, W.W. Grabowski, B. Rosa, and L.-P. Wang, "Turbulent collision-coalescence of cloud droplets and its impact on warm rain formation," Symposium on Clouds, Aerosols and Radiation, European Geosciences Union General Assembly, Vienna, Austria, April 2-7, 2006.

96. B. Afsharpoya and L.P. Wang, "Modeling fluid flow and heat transfer in PEM fuel cell using lattice Boltzmann approach." *Bull. Am. Phy. Soc.*, Vol. 50 (9): p35, 2005.

97. L.P. Wang, O. Ayala, W.W. Grabowski, "Motion of heavy particles in a bidisperse turbulent suspension." *Bull. Am. Phy. Soc.,* Volume 50 (9): p95, 2005.

98. O. Ayala, W. W. Grabowski, and L-P. Wang, "Calculations of collision efficiency using superposition method." *Bull. Am. Phy. Soc.*, Vol. 48. No. 10. p30, 2003.

99. Y. Xue, O. Ayala, W. W. Grabowski, and L.-P. Wang, "On the modeling of a true stochastic coalescence equation." *Bull. Am. Phy. Soc.*, Vol. 48. No. 10. p30, 2003.

100. L-P. Wang, O. Ayala, and W. W. Grabowski, "Effect of turbulence on collision efficiency of cloud droplets. Part 1. Theoretical formulation." *22nd Annual AAAR Conference*, Anaheim, California, October 20-24, 2003.

101. O. Ayala, W. W. Grabowski, and L-P. Wang, "Effect of turbulence on collision efficiency of cloud droplets. Part 2. Numerical results." *22nd Annual AAAR Conference*, Anaheim, California, October 20-24, 2003.

102. Y. Xue, O. Ayala, W. W. Grabowski, and L.-P. Wang, "On the modeling of a true stochastic coalescence equation." *22nd Annual AAAR Conference*, Anaheim, California, October 20-24, 2003.

103. L-.P. Wang, O. Ayala, Y. Xue, and W. W. Grabowski, "Effects of turbulence on the coagulational growth of cloud droplets – An overview and recent results." *9th International*

Symposium on Gas-Particle Flows, Fluids Engineering Division Summer Meeting, Honolulu, Hawaii, July 6-10, 2003.

104. L.-P. Wang, "Derivation, application, and modeling of true stochastic coalescence equations." *XXIII General Assembly of The International Union of Geodesy and Geophysics*, Sapporo, Japan, June 30 to July 11, 2003.

105. L-.P. Wang, O. Ayala, Y. Xue, and W. W. Grabowski, "Effects of turbulence on the coagulation growth of cloud droplets." *XXIII General Assembly of The International Union of Geodesy and Geophysics*, Sapporo, Japan, June 30 to July 11, 2003.

106. G. He, R. Rubinstein, and L.-P. Wang, "Effects of eddy viscosity on time correlations in large eddy simulation." *NASA/CR-2001-210860*, ICASE Report No. 2001-10, 2001.

107. G. He, R. Rubinstein, and L.-P. Wang, "Effects of eddy viscosity on time correlations in large eddy simulation." *Bull. Am. Phy. Soc.*, Vol. 46 (10), p.20, November 2001.

108. O. Ayala and L.-P. Wang, "Effects of turbulence on the coagulation rate of cloud droplets." *Bull. Am. Phy. Soc.*, Vol. 46 (10), p71, November 2001.

109. J. DeSpirito and L.-P. Wang, "Spatial instability of viscous two-way coupled particle-laden jet." *Bull. Am. Phy. Soc.*, Vol. 46 (10), p.148, November 2001.

110. W.H. Matthaeus, L.-P. Wang, P. Dmitruk, O. Ayala, L.-S. Luo, "Comparison of pseudospectral and lattice Boltzmann method simulations of incompressible turbulence: accuracy and performance on a parallel computer cluster", *10th International Conference on DISCRETE SIMULATION OF FLUID DYNAMICS - NEW TRENDS, NEW PERSPECTIVES*, Cargèse, Corse, France, July 2-7, 2001.

111. L.-P. Wang, A.S. Wexler, Y. Zhou, "Modeling geometric collision rate of inertial particles in turbulent flow." *AAAR annual meeting*, Tacoma, Washington, October 11-15, 1999.

112. L.-P. Wang, A.S. Wexler, and Y. Zhou, "On the velocity correlation of two colliding heavy particles in turbulent flow." *Abstracts of AAAR'97*, p. 46, 1997.

113. Y. Zhou, A.S. Wexler, and L.-P. Wang, "On the collision rate of heavy particles in fully developed turbulence." *Abstracts of AAAR'97*, p. 47, 1997.

114. L.-P. Wang and M.R. Maxey, "Some dynamic feature of microbubble transport in isotropic turbulence." *Bull. Am. Phy. Soc.*, 41(9), 1784, 1996.

115. M. Ulitsky, L. Collins, and L.-P. Wang, "Turbulent premixed flamelet model: A multi-point statistical description." *Bull. Am. Phy. Soc*., 41(9), 1748, 1996.

116. X-L Tong and L-P Wang, "Spectral simulation of three-dimensional mixing layer in unbounded domain." *Bull. Am. Phy. Soc*., 41(9), 1744, 1996.

117. Y. Zhou and L.-P. Wang, "On the collision rate of heavy particles in isotropic turbulence." *Bull. Am. Phy. Soc*., 41(9), 1784, 1996.

118. B. Shome, M.H. Santare, L.-P. Wang, A.K. Prasad, A.Z. Szeri, D. Roberts, "Modeling of airflow in the nasopharynx with application to sleep apnea." *Bull. Am. Phy. Soc*., 41(9), 1781, 1996.

119. M.R. Maxey, B.K. Patel, E.J. Chung, and L.-P. Wang, "Simulations of dispersed turbulent multiphase flow." *International Symposium on Mathematical Modeling of Turbulent Flows*, The University of Tokyo, Japan, December 18-20, 1995.

120. S. Herr, L.-P. Wang, and L.R. Collins, "EDQNM analysis of a spectrally axisymmetric scalar field." *Bull. Am. Phy. Soc*., 40(12), 1974, 1995.

121. X.-L. Tong and L.-P. Wang, "Dispersion and mixing of heavy particles in 3D mixing layer." *Society of Engineering Science, 32nd Annual Technical Meeting* (ed. David Hui & Stathis Michaelides), pp653-654, New Orleans, LA, October 29 to November 2, 1995.

122. J. DeSpirito and L.-P. Wang, "Dispersion and mixing control of heavy particles in a 3D Jet." *Society of Engineering Science, 32nd Annual Technical Meeting* (ed. David Hui & Stathis Michaelides), pp657-658, New Orleans, LA, October 29 to November 2, 1995.

123. Y. Zhou, M.R. Maxey, S. Chen, and L.-P. Wang, "Structure and spectrum of DNS turbulence in viscous and hyperviscous fluid." *Society of Engineering Science, 32nd Annual Technical Meeting* (ed. David Hui & Stathis Michaelides), pp655-656, New Orleans, LA, October 29 to November 2, 1995.

124. R. Zhang and L.-P. Wang, "Large-eddy simulation of aerosol dispersion and suspension in the atmospheric boundary layer." *Proceedings of Society of Engineering Science, 32nd Annual Technical Meeting* (ed. David Hui & Stathis Michaelides), pp651-652, New Orleans, LA, October 29 to November 2, 1995.

125. L.-P. Wang, S. Chen, J.G. Brasseur, and J.C. Wyngaard, "Examination of Kolmogorov refined similarity hypotheses through high-resolution simulations." *Bull. Am. Phy. Soc.*, 39(9), 1955, 1994.

126. D. Martinez, S. Chen, L.-P. Wang, and Y. Zhou, "Study of energy transfer in the far-dissipation range of turbulence." *Bull. Am. Phy. Soc*., 39(9), 1954, 1994.

127. S. Chen, G.D. Doolen, R. Kraichnan, and L.-P. Wang, "Is Kolmogorov refined similarity hypothesis a dynamic or kinematic property of turbulence?" *Bull. Am. Phy. Soc*., 39(9), 1955, 1994.

128. J.G. Brasseur, L.-P. Wang, and S. Chen, "Response of passive scalar to large-scale anisotropic forcing in velocity." *Bull. Am. Phy. Soc*., 39(9), 1955, 1994.

129. L.-P. Wang and J.G. Brasseur, "Contribution of long-range interactions to small-scale phase changes in isotropic turbulence." *Bull. Am. Phy. Soc*., 38(12), 2243, 1993.

130. L.-P. Wang and M.R. Maxey, "Concentration field and rise velocity of microbubbles in isotropic turbulence." *Bull. Am. Phys. Soc*. 37(8), 1758, 1992.

131. L.-P. Wang and M.R. Maxey, "Particle settling velocity in a forced isotropic and homogeneous turbulence." *Bull. Am. Phys. Soc*., 36(10), 2697, 1991.

132. L.-P. Wang and D.E. Stock, "Scaling and interpretation of dispersion relation for heavy particles in turbulent flows." *Bull. Am. Phys. Soc*., 35(10), 2261, 1990.

133. D.E. Stock and L.-P. Wang, "Lagrangian simulation of particle dispersion based on Eulerian velocity correlations." *Bull. Am. Phys. Soc*., 34(10), 2312, 1989.

134. L.-P. Wang, T.D. Burton, and D.E. Stock, "Chaotic dynamics of heavy particle dispersion: Fractal dimension versus dispersion coefficients." *Bull. Am. Phys. Soc*., 34(10), 2295, 1989.

135. L.-P. Wang and D.E. Stock, "Relationship between Lagrangian and Eulerian statistics and its application to turbulent diffusion." *Bull. Am. Phys. Soc*., 33(10), 2264, 1988.

136. L.-P. Wang and D.E. Stock, "Experimental measurements and numerical simulation of characteristic scales for turbulent dispersion of large particles." *Bull. Am. Phys. Soc*., 32(10), 1987.

Invited Talks

1. *Understanding turbulent collision rate of cloud droplets through direct numerical simulation,* Workshop on Cloud Microphysics and Turbulence, University of Hyogo, Kobe, Japan, November 24, 2016.
2. *Two-way Interactions in Particle-Laden Turbulent Channel Flow: Results from Interface-Resolved Simulations,* Seminar to Department of Mechanical Engineering, Osaka University, Osaka, Japan, November 22, 2016.
3. *Mesoscopic simulations of complex turbulent flows: An overview and recent developments,* Seminar to Department of Aeronautics and Astronautics and Department of Mechanical Engineering and Science, Kyoto University, Kyoto, Japan, October 31, 2016.
4. *Mesoscopic simulations of complex turbulent flows: An overview and recent developments,* An invited keynote lecture at The Second International Workshop on Numerical Simulation of particle/droplet/bubble-laden multiphase flows, Earth Simulator Center, Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan, October 13, 2016.
5. *Turbulence modulation and particle dynamics obtained from particle-resolved direct numerical simulations*, Workshop in memory of Zaichik on "Contemporary Methods for Multiphase Turbulent Flows Modeling"*,* Moscow, May 30, 2016.
6. *Two-Way Interactions in Particle-Laden Turbulent Channel Flow: Results from Interface-Resolved Simulations*, Invited seminar at Department of Mechanical Engineering, Pennsylvania State University, April 1, 2016.
7. *Mesoscopic direct numerical simulation of turbulent flows laden with finite-size solid particles*, Invited Talk at the State Key Laboratory of Clean Energy Utilization, Zhejiang University, Hangzhou, China*,* August 19, 2015.
8. *New lattice-Boltzmann schemes of the Navier-Stokes equations on non-standard grids*, Invited talk at Symposium on the Theory and Application of the Boltzmann Equation, the Chinese Congress of Theoretical and Applied Mechanics 2015, Shanghai, China*,* August 18, 2015.
9. *Mesoscopic direct numerical simulation of turbulent flows laden with finite-size solid particles*, Seminar at the Institute of Thermal Engineering, Tsinghua University, Beijing, China*,* July 25, 2015
10. *Direct numerical simulation of turbulent flows using mesoscopic methods: I. Single-phase turbulent flows.* Invited short-course lecture at the 12th International Conference for Mesoscopic Methods in Engineering and Science (ICMMES 2015), Beijing, China, July 20, 2015.
11. *Direct numerical simulation of turbulent flows using mesoscopic methods: II. Turbulent flows laden with finite-size particles.* Invited short-course lecture at the 12th International Conference for Mesoscopic Methods in Engineering and Science (ICMMES 2015), Beijing, China, July 20, 2015.
12. *New lattice-Boltzmann schemes of the Navier-Stokes equations on non-standard grids*, Seminar at the National Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences, Beijing, China*,* July 18, 2015.
13. *Lattice Boltzmann simulation of turbulent flows laden with finite-size particles*. Seminar at Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan, June 8, 2015.
14. *Two-Way Interactions in Particle-Laden Turbulent Channel Flow: Results from Particle-Resolved Simulations*, Invited seminar at Department of Mechanical Engineering, Iowa State University, April 8, 2015.

15. *Two-Way Interactions in Particle-Laden Turbulent Channel Flow: Results from Particle-Resolved Simulations*, Boulder Fluid Dynamics Seminar, University of Colorado at Boulder, January 27, 2015.
16. *Two-Way Interactions in Particle-Laden Turbulent Channel Flow: Results from Particle-Resolved Simulations*, Department of Engineering Mechanics, Zhejiang University, Hangzhou, China, January 16, 2015.
17. *Modulation of Turbulence and Heat Transfer by Solid Particles* (a keynote talk), Energy Technologies Conference (ENTECH'14), Istanbul, Turkey, December 22, 2014.
18. *Study of turbulence modulation by finite-size solid particles using the lattice Boltzmann approach*. Invited seminar at Department of Computational Science and Engineering, Yonsei University, Seoul, South Korea. July 9, 2014.
19. Impacts of small-scale turbulence on cloud and precipitation processes in maritime shallow convection. Invited seminar at Department of Computational Science and Engineering, Yonsei University, Seoul, South Korea. July 8, 2014.
20. *Particle-resolved simulation of particle-laden flows using the lattice Boltzmann approach: Implementation issues, benchmarking, and physical results.* At International Symposium on Fundamental Issues of Multiphase Flows, Huazhong University of Science and Technology, Wuhan, China, June 14, 2014.
21. *Computational and theoretical study of turbulent collision and growth of inertial particles.* At Summer school on Fundamental Issues of Multiphase Flows, Huazhong University of Science and Technology, Wuhan, China, June 9-12, 2014.
22. *Particle-resolved simulations of turbulent particle-laden flows*, an invited keynote at the annual meeting of the National Key Lab of Turbulence and Complex Systems, Peking University, Beijing China, January 9, 2014.
23. *Study of Particle-turbulence interaction using particle-resolved simulations, a*n invited keynote at the National Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences, Beijing, China*,* December 20, 2013
24. *Two-way interactions in particle-laden turbulent channel flow: preliminary results from particle-resolved simulations*, Seminar at Peking University, State Key Lab of Turbulence and Complex Systems, Peking University, Beijing China, December 3, 2013.
25. *Study of turbulence modulation by finite-size solid particles using the lattice Boltzmann approach,* Seminar at the National Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences, Beijing, China*,* December 2, 2013.
26. *Turbulent collision-coalescence of cloud droplets: simulation, parameterization, and application.* Atmospheric Modeling at LES Scales Workshop, Argonne National Lab, Sept. 4, 2013.
27. *Volume-averaged momentum and scalar transport equations in porous media,* seminar at the State Key Lab on Coal Combustion, Huazhong University of Science & Technology, Wuhan, China, July 4, 2013.
28. *Study of turbulence modulation by finite-size solid particles using the lattice Boltzmann approach,* International Symposium on Turbulence Particle-Laden Flow and Coal Combustion, Huazhong University of Science & Technology, Wuhan, China, June 5, 2013.
29. *Flow modulation in decaying and forced particle-laden turbulence,* An invited keynote lecture at International Workshop on Numerical Simulation of particle/droplet/bubble-laden multiphase

flows, Earth Simulator Center, Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan, May 23, 2013.

30. *Multiphase flows in environmental science and engineering,* Seminar at the State Key Laboratory for Coal Combustion, Huazhong University of Science & Technology, China, January 16, 2013.
31. *Transport and retention of colloids and nanoparticles in soil porous media.* Seminar at Tsinghua-UD Workshop on Nanotechnology for energy and environment*,* Shenzhen, China, January 12, 2013.
32. *Lattice Boltzmann simulation of turbulent and multiphase flows.* Seminar at Pall Corporation, Cortland, New York, November 26, 2012.
33. *Turbulence modulation by inertial particles.* Seminar, Department of Mechanical Engineering, CUNY City College, Oct. 4, 2012.
34. *Environmental multiphase flow – A new frontier.* NCAR GTP Workshop on *Multiphase Turbulent Flows in the Atmosphere and Ocean,* Boulder, Colorado, August 13, 2012.
35. *Turbulence modulation by finite-size inertial particles.* Invited seminar, Department of Mechanics, Zhejiang University, July 13, 2012.
36. *Application of direct numerical simulation in environmental multiphase flows.* Invited seminar at the Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, July 12, 2012.
37. *Some open issues in cloud microphysics and precipitation formation.* Invited seminar at the Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, July 11, 2012.
38. *Growth of cloud droplets in a turbulent environment.* Invited seminar at the State Key Lab of Numerical Modeling for Atmospheric Sciences & Geophysical Fluid Dynamics (LASG), Institute of Atmospheric Physics, Chinese Academy of Sciences, April 11, 2012.
39. *Turbulence modulation by finite-size inertial particles*. Invited talk at COST conference on Particles in Turbulence, Leiden, Holland, May 14, 2012.
40. *Turbulence modulation by finite-size inertial particles*. KITPC talk for "New Directions in Turbulence", April 10, 2012.
41. *Global study experience at the University of Delaware*. Talk for GLOBEX exchange program at Peking University, March 30, 2012.
42. *The role of air turbulence in warm rain initiation*: *simulations, parameterization, and impact study*. KITPC talk for "New Directions in Turbulence", March 29, 2012.
43. *Lattice Boltzmann simulation of turbulent and multiphase flows. POSE* Seminar, College of Earth, Ocean, and Environment, University of Delaware. March 2, 2012.
44. *Turbulent collision-coalescence of cloud droplets: Simulation, parameterization, and application*, Joint MMM/GTP seminar at the National Center for Atmospheric Research, July 21, 2011.
45. *Direct numerical simulation of turbulent particle-laden flows*. Mechanical Engineering Seminar, University of Delaware, Newark, Delaware**,** October 8, 2010.
46. *Numerical studies of collisions among particles,* Invited 3-hr lecture, at The Summer School on *Fluctuations and turbulence in the microphysics and dynamics of clouds*, Porquerolles, France, Sept 2-10, 2010.
47. *Direct numerical simulation of particle-laden turbulent flow,* Invited seminar, Department of Atmospheric Sciences**,** Yonsei University, Seoul, South Korea, 1 September 2010.

48. *Turbulent collision-coalescence of cloud droplets and its impact on warm rain initiation,* Third International Workshop on Next-Generation NWP Models: Bridging parameterization, explicit clouds and large eddies, Jeju Island, South Korea, 29 August – 1 September, 2010.

49. Simulation and Analysis of Small-scale Compressible Turbulence, Seminar at Center for Fluid Mechanics, Turbulence, and Computation, Division of Applied Mathematics, Brown University, March 2, 2010.

50. Particle-Resolved Numerical Simulation of Turbulent Suspension Flow Using the Lattice Boltzmann Equation, Invited session on Lattice Boltzmann Method and Its Applications, 2010 March Meeting of the American Physical Society, March 17, 2010, Portland, Oregon.

51. *Direct Numerical Simulations of Particle-Laden Flows*, Department Seminar Series, Department of Engineering Mechanics, School of Aerospace, Tsinghua University, Beijing, China, December 30, 2009.

52. *Direct Numerical Simulations of Particle-Laden Flows*, Department Seminar Series, Department of Mechanical and Power Engineering, National Tsing Hua University, Hsinchu**,** Taiwan, December 16, 2009.

53. *Turbulent collision-coalescence of cloud droplets and its impact on warm rain initiation*, Fluid Mechanics Seminar at the State Key Laboratory for Turbulence and Nonlinear Systems, Peking University, Beijing, China, November 13, 2009.

54. *Turbulent collision-coalescence of cloud droplets: Recent advances and open issues*, Forum on Multiphase Processes in Geophysical and Environmental Flows, ASME Fluids Engineering Division Summer Meeting, August 6, 2009, Vail, Colorado.

55. Lattice Boltzmann method and its applications. Invited lecture talk for MATH 838, Numerical Methods: Partial Differential Equations, University of Delaware, April 16, 2009.

56. *Numerical Weather Prediction and Climate Modeling*, Invited Talk for Math Awareness Month, Department of Mathematical Sciences, University of Delaware. April 14, 2009.

57. *Turbulent collision-coalescence of cloud droplets and its impact on warm rain initiation*, The 4th IMS Turbulence Workshop on *Clouds and Turbulence,* Imperial College, London, March 23, 2009.

58. *Simulation of Viscous Flow and Colloid Transport in Saturated Soil Porous Media,* SIAM Conference on Computational Science and Engineering (CSE09), March 2, 2009, Miami Hilton Hotel, Miami, Florida.

59. *Turbulent Collision-Coalescence of Cloud Droplets and its Impact on Warm Rain Initiation*, Fluid Mechanics Seminar Series, University of Washington, Seattle, Washington, January 23, 2009.

60. *Turbulent Collision-Coalescence of Cloud Droplets and its Impact on Warm Rain Initiation*, International School and Workshop on *Dynamics of Inertial Particles: From Ocean and Atmosphere to Planets,* Max Planck Institute of Physics and Complex Systems, Dresden, Germany, September 15, 2008.

61. *On Piecewise Log-Normal Approximation and its Application to the Kinetic Collection Equation*, MMM seminar at the National Center for Atmospheric Research, August 19, 2008.

62. Turbulent Collision-Coalescence of Cloud Droplets and its Impact on Warm Rain Initiation, Workshop on Physics of Climate Change, Kavli Institute for Theoretical Physics, Santa Barbara, July 2, 2008, talk made available online at http://online.itp.ucsb.edu/online/climate08/wang/

63. *Direct Numerical Simulation of Particle-Laden Flows*, International Conference on Applied Mathematics: Modeling, Analysis and Computation. June 2, 2008, Hong Kong.

64. *Direct Numerical simulations of particle-laden flows.* Seminar for UD Computer Science Group Meeting (Peter Monk), University of Delaware. February 18, 2008.

65. *Direct Numerical simulations of particle-laden flows. POSE* Seminar, College of Marine and Earth Studies, University of Delaware. November 9, 2007.

66. *Direct Numerical simulations of particle-laden flows.* Seminar for ELEG662, Department of Electrical Engineering, University of Delaware. October 3, 2007.

67. *Direct Numerical simulations of particle-laden flows.* GTP and MMM joint seminar at the National Center for Atmospheric Research. August 16, 2007.

68. *The role of turbulence in warm rain initiation.* Seminar at Institute of Geophysics, Warsaw University, Warsaw, Poland. July 16, 2007.

69. *The role of turbulence in warm rain initiation.* Seminar at Institute of Atmospheric Sciences and Climate, Italian National Research Council, Rome, Italy, July 6, 2007.

70. *The role of turbulence in warm rain initiation.* Workshop on Particle-Laden Flows and its Application to Environmental and Chemical Engineering, Chinese Academy of Sciences, Beijing, China, May 27, 2007.

71. *Environmental Fluid Mechanics: Naturally Occurring Flow Systems.* Third Annual Business, Technology & Careers Conference, Department of Mechanical Engineering, University of Delaware. April 27, 2007.

72. *Turbulent Collision-Coalescence of Cloud Droplets and Warm Rain Initiation.* MMM Seminar at the National Center for Atmospheric Research. January 18, 2007.

73. *Effects of air turbulence and stochastic coalescence on the size distribution of cloud droplets.* Invited seminar at Institute of Mechanics, Chinese Academy of Sciences, Beijing, China, July 1, 2006.

74. *Direct simulations of turbulent particle-laden flows.* Invited seminar at Institute of Mechanics, Chinese Academy of Sciences, Beijing, China, June 30, 2006.

75. *Modeling fluid flow and species transport in fuel cells using the lattice-Boltzmann approach*. Presented at The 14th International Conference on Discrete Simulation of Fluid Dynamics in Complex Systems, Kyoto University, Kyoto, Japan, August 23, 2005.

76. *On the accuracy and Convergence of numerical solution of the collision-coalescence equation*. Mesoscale and Microscale Meteorology Seminar series at National Center for Atmospheric Research, Boulder, CO, January 6, 2005.

77. *Towards Better Understanding and Quantification of Turbulence Effects on Collision Rates of Cloud Droplets*. Presented at Mini-Symposium on Incorporation of Particle-Turbulence Interactions in Geophysical Suspensions, American Physical Society/2004 Annual Meeting of Division of Fluid Dynamics, Seattle, WA, November 21, 2004.

78. *Towards Better Understanding and Quantification of Turbulence Effects on Collision Rates of Cloud Droplets*. Seminar at Mesoscale and Microscale Meteorology (MMM) Division, National Center for Atmospheric Research, Boulder, CO, August 26, 2004.

79. *Multiscale simulations of turbulent particle-laden flows.* Presented at 13th International Conference on the Discrete Simulation of Fluid Dynamics, Boston, MA, August 16, 2004.

80. *Direct Simulations of Turbulent Particle-Laden Flows*. Invited seminar at Institute of Fluid Engineering, Zhejiang University, Hangzhou, China, June 18, 2004.
81. *Droplet-Turbulence Interactions in Atmospheric Clouds and Their Implications on the Warm Rain Formation: Recent Progress and Open Issues*. Workshop on Warm-Rain Physics, McGill University, Montreal, Canada, May 17, 2004.
82. *Effects of turbulence on the coagulational growth of cloud droplets*. Department of Mechanical Engineering Fall 2003 Colloquium Series, New Jersey Institute of Technology, Newark, New Jersey, November 12, 2003.
83. *Droplet-turbulence interactions in atmospheric clouds and their implications on the warm rain formation*, Mechanical Engineering Seminar Series, University of Delaware, Newark, Delaware, November 7, 2003.
84. *Effects of turbulence on the coagulational growth of cloud droplets – An overview and recent results*. A Keynote Presentation at the Ninth International Symposium on Gas-Particle Flows, 2003 Fluids Engineering Division Summer Meeting, Honolulu, Hawaii, July 9, 2003.
85. *Learning and Doing: The Solar Decathlon.* A panel presentation with P. Paxton Marshall (University of Virginia) and Henry W. Brandhorst, Jr. (Auburn University), AAUP 89th Annual meeting "Liberal Education and Social Responsibility", Washington D.C., June 14, 2003.
86. *Effects of turbulence on the coagulational growth of cloud droplets*. Mesoscale and Microscale Meteorology Seminar Series, National Center for Atmospheric Research, Boulder, Colorado, February 25, 2003.
87. *Particle Transport and Flow Modulation in Particle-Laden Shear Flows*. Seminar at the National Cheng Kung University, Taiwan, January 8, 2001.
88. *Simulation and Modeling Turbulent Coagulation of Inertial Particles*. Seminar at National Taiwan University, Taiwan, January 5, 2001.
89. *Simulation and Modeling Turbulent Coagulation of Inertial Particles*. Seminar at Levich Institute, CUNY, September 6, 2000.
90. *Direct Numerical Simulation of Turbulence: LBE and Spectral Methods*. Presented at a workshop on ``Kinetic Methods for CFD and Parallel Computing'', ICASE/NASA Langley, Hampton, Virginia, August 16, 2000.
91. *Modeling Turbulent Coagulation of Inertial Particles*, An invited presentation at the ASME Fluids Engineering Summer Meeting, Boston, June 13, 2000.
92. *Simulation of Two-way Coupled, Particle-laden Mixing Layer*, Forum on Multiphase Flows - Work in Progress, ASME Fluids Engineering Summer Meeting, Washington D.C., June 22, 1998.
93. *On Statistical Mechanical Descriptions of Turbulent Coagulation*, Mini-Symposium on Multiphase Flows and Fluid Turbulence, The 19th Annual Meeting of Canadian Applied and Industrial Mathematics Society and 13th Canadian Symposium on Fluid Dynamics, Simon Fraser University, BC, May 29, 1998.
94. *On the Average Settling Velocity of Aerosols in the Atmospheric Boundary Layer*, Seminar at the US Army Research Laboratory, Adelphi, Maryland, December 11, 1997.
95. *Turbulent Collision of Finite-Inertia Particles*. Mechanical Engineering Seminar Series at University of Maryland, November 14, 1997.
96. *Direct Simulation of Three-Dimensional Particle-Laden Mixing Layer*. Department of Mechanical Engineering, The Johns Hopkins University, October 9, 1997.

97. *Towards Numerical Experiments of Single- and Two-Phase Flows in a Mixing Vessel*, DuPont Experimental Station, September 23, 1997.
98. *Direct Simulations of Particle Transport in Two and Three Dimensional Mixing Layers*. Seminar at The State Key Lab for Turbulence Research and Center for Nonlinear Science, Department of Mechanics and Engineering Science, Peking University, June 2, 1997.
99. *Transport and Collision Rate of Heavy Particles in Fully-Developed Turbulence*, Department of Engineering Mechanics and National Key Lab of Coal Combustion, Tsinghua University, China, May 30, 1997.
100. *Transport and Collision Rate of Heavy Particles in Fully-Developed Turbulence*. Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, November 14, 1996.
101. *Study of Passive Scalar Dynamics through High-Resolution Simulations*. Presented at Workshop on Scaling Dynamics and Fluid Turbulence, Los Alamos National Laboratory, August 15, 1996.
102. *Chaotic dynamics of particle dispersion in fluids*. Presented at the 6th Symposium on Gas-Solid Flows, ASME Fluids Engineering Summer Meetings, Portland, Oregon, June 25, 1991.

Research Supervision

Doctoral students for whom I have served (or am serving) as advisors and their current position:

1. Xin Wen, 8/2015– present, "Mesoscopic simulations of turbulent and multiphase flows".
2. Cheng Peng, 7/2013 – present: "Particle-resolved simulation of turbulent particle-laden flow"
3. Grace Shi, 6/2007 – 10/2016: "Lattice Boltzmann simulations of two-phase flow in a microchannel model and colloids transport with a study of electrostatic force for nanoparticles". Since 9/2011, worked as Engineer at PSEG Services Corporation (nuclear power plant at Hope Creek Generating Station) in Salem, NJ.
4. Queming Qiu, 7/2008 – 12/2015: "Theoretical and computational study of colloid transport in saturated soil porous media".
5. Hossein Parishani, 6/2008 – 4/2014: "High-resolution simulation of turbulent collision-coalescence of cloud droplets". Currently, a postdoctoral researcher in Mike Pritchard's group in the Department of Earth System Science at UC Irvine.
6. Hui Gao, 6/2006 – 2/2013: "Direct simulation of particle-laden viscous flows and their applications". Since 12/2010, worked as Scientist at United Technologies Research Center in East Hartford, Connecticut.
7. Yan Xue, 6/2002 – 5/2006: "Effects of air turbulence and stochastic coalescence on the growth of cloud droplets.'' Currently working at Dell Financial Services in Austin, Texas on Risk Management Decision Science.
8. Orlando Ayala, 8/2001 – 8/2005: "Effects of turbulence on the collision rate of cloud droplets." Now Assistant Professor (since 8/201) in the Department of Engineering Technology at Old Dominion University, Norfolk, VA.
9. Jim DeSpirito, 2/1995 – 8/2004: "Particle dispersion and flow modulation in particle-laden jet." Now Aerospace Engineer in Flight Sciences Branch at U.S. Army Research Laboratory, Aberdeen Proving Ground, MD.

10. Rao-Yang Zhang, 1/1995 – 5/2000: "Lattice Boltzmann approach for multiphase flows.'' Now Director of Physics Algorithm Development at Exa Corp., Lexington, MA.
11. Yong Zhou, 1/1995-5/1999: "Geometric collision rate of inertial particles in fully-developed turbulence." Now Senior Physicist / Engineer, Exa Corp., Lexington, MA.
12. Xiao-Ling Tong, 9/1994 -7/1998: "Particle transport and flow modulation in particle-laden mixing layers." Now Research Assistant Professor of Computational Engineering and Center for Advanced Vehicle System, Mississippi State University.

Doctoral students for whom I have served (or am serving) as co-advisor and their current position:

1. Jie Shen, 9/2016 – : "Modeling atmospheric flows using mesoscopic methods", as foreign co-advisor. Advisor: Professor Zhiming Lu, Shanghai University, China,
2. Assylzhan Kizbayev, 10/2016 – present: "Mathematical modeling of impact of electron intensity on the chemical kinetics of the multiphase medium", as foreign co-advisor. Advisor: Professor Zhakebayev Dauren, Al-Farabi Kazakh National University, Kazakhstan
3. Abdigaliyeva Akmaral, 1/2012 – present: "Large eddy simulation for research a heterogeneous turbulent flows", as foreign co-advisor. Advisor: Professor Zhakebayev Dauren, Al-Farabi Kazakh National University, Kazakhstan
4. Peng Wang, 6/2014 – 1/17/2016: Development of Discrete Unified Gas Kinetic Scheme for Fluid Flows. As co-advisor, advisor: Prof. Zhaoli Guo, Huazhong U of Sci. and Technology, China
5. Gaojie Liu, 6/2013 – 1/2015: Quantifying mixing between miscible fluids by viscous finger at the pore scale, as co-advisor, advisor: Prof. Zhaoli Guo, Huazhong U of Sci. and Technology, China
6. Wenjuan (Wendy) Zheng, 9/2011 – 7/2014: "Study of surface roughness on colloid retention." As co-advisor, advisor: Dr. Yan Jin of Plant and Soil Sciences.
7. Jianchun Wang, 9/2009 – 6/2012: "Direct simulation and analysis of compressible turbulence." As co-advisor, advisor: Dr. Shiyi Chen, College of Engineering, Peking University.
8. Valentin Neacsu, 9/2006 – 8/2009: "Investigation of multiphase porous-medium flows." As co-advisor, advisor: S.G. Advani of Mechanical Engineering.
9. Volha I Lazouskaya, 9/2004 – 7/2008: "Colloidal transport in microchannels with gas-liquid-solid interfaces." As co-advisor, advisor: Dr. Yan Jin of Plant and Soil Sciences. Currently a Research Scientist at Environmental Services, Shaw Groups Inc., New Jersey.
10. Jie (Jodie) Han, 9/2004 – 5/2008: "Transport and retention of viruses and microspheres in saturated and unsaturated porous media." As co-advisor, advisor: Dr. Yan Jin of Plant and Soil Sciences.

Postdoctoral Fellows and Visiting Scientists for whom I have served (or am serving) as advisors and their current position:

1. Jie Shen, 9/2016 – 8/2018, "Modeling atmospheric flows using mesoscopic methods", Ph.D. student from Shanghai University, Shanghai, China
2. Chao Li, 9/2016 – 9/2017, "Mesoscopic simulations of multiphase flows through porous media", Visiting scholar from Dalian Maritime University, Dalian, China
3. Dauren Zhakebayev, April 2015, "Direct and large-eddy simulations of turbulent flows", Professor from Al Farabi Kazakh National University, Almaty, Kazakhstan

4. Akmaral Abdigalieva, April to May, 2015, "Direct and large-eddy simulations of turbulent flows", Ph.D. student from Al Farabi Kazakh National University, Almaty, Kazakhstan
5. Yuntian Bo, Visiting Scholar, 2/2015-5/2015, "Parallel implementation and validation of a discrete unified gas kinetic scheme for turbulent flow simulation", Senior student from Peking University, China.
6. Vinous Hameed, Visiting Professor, 7/2014 - 9/2014, "Design of novel fin-enhanced heat exchangers", Lecturer of College of Engineering, Nahrain University, Iraq.
7. Songying Chen, Visiting Professor, 12/2013-12/2014, "Study of complex flows relevant to process equipment and chemical engineering", Professor, Shandong University, China
8. Yuan Zong, Visiting Professor, 11/21/2013-11/20/2014, "Simulations of complex flows relevant to chemical engineering processes", Assistant Professor, East China University of Science and Technology, Shanghai, China
9. Dr. Guogang Yang, Visiting Professor, 9/2012-9/2013: "Multiscale modeling of species transport and reaction in solid oxide fuel cells", Associate Professor of Marine Engineering, Dalian Maritime University, Dalian, China.
10. Oscar Castro from Colombia, 6/10/13-12/10/13: "Parallel simulation of turbulent particle-laden flows".
11. Dr. Orlando Ayala, 11/2009 – 7/2013: "Petascale computing of turbulent collision of cloud droplets and cloud dynamics modeling". Now Assistant Professor in the Department of Engineering Technology at Old Dominion University, Norfolk, VA.
12. Dr. Zhaosheng Yu, Visiting Professor, 11/2012-12/2012: "Particle-resolved simulation of particle-laden flows", Associate Professor of Zhejiang University, Hangzhou, China.
13. Dr. Mingliang Xie, Visiting Professor, 9/2011-9/2012: "Simulation and dynamics of multiphase flows", Associate Professor, The State Key Laboratory of Coal Combustion, Huazhong University of Science and Technology, Wuhan, China.
14. Dr. Chao Wang, co-advised, Postdoc with Yan Jin, 1/2010 - 2/2012: project "Retention and transport of silica nanoparticles in saturated porous media", now Postdoc at Indiana University.
15. Dr. Guo-Dong Jin, Visiting Scholar, 10/2010 – 1/2011: "Development of particle-resolved flow simulations", now a Scientist at Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences.
16. Dr. Guo-Dong Jin, 10/2008 – 1/2009: "Issues in large-eddy simulations of particle-laden flows", now a Scientist at Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences.
17. Dr. Bogdan Rosa, 1/2006 – 12/2008: "Effects of Turbulence on the Collision-Coalescence Growth of Cloud Droplets", now a Research Scientist at Institute of Meteorology and Water Management, Warsaw, Poland.
18. Dr. Behnam Afsharpoya, 2/2005 – 01/2006: "LBE modeling of fluid flows in fuel cells." Now a Research Engineer at Invercon, LLC, PA.
19. Dr. Murat Aktas, 9 – 10/2004, "LBE simulation of Complex channel flow." Now a faculty at a university in Turkey.
20. Dr. Pablo Dmitruk (Bartol Research Institute), 2001-2002. "Parallel implementation of FFT on a Beowulf Cluster." Co-advised with W H Matthaeus. Now a Professor of Geophysics in Argentina.

21. Dr. Daniel Martinez, 1/1996–2/1997: "High-performance simulations of complex turbulent flows."
22. Dr. Biswadip Shome, 11/1995–11/1996: "Airflow characterization in the pharynx and its application to sleep apnea." Co-advised with M.H. Santare.

Master's students for whom I have served (or am serving) as advisors (and their current position):

1. Harish Opadrishta, 9/2014 – 8/2016, "Multiple-relaxation-time lattice Boltzmann simulations of turbulent pipe flows".
2. Sandipan Banerjee, 8/2014 – 5/2016, "Turbulent collision statistics of cloud droplets at low dissipation rates".
3. Haoda Min, 9/2014 – 5/2016, "Development of lattice Boltzmann models for non-cubic grid".
4. Chen Leo Liu, 6/2012 – 5/2014: "Parallel implementations and comparison of high-order finite-difference, spectral, and lattice-Boltzmann methods"
5. Stephanie Merkler, 6/2006 – 3/2008: "The Piecewise Log-normal approximation and its application to the kinetic collection equation." Currently Engineer at Lockheen Martin.
6. Jeff Doody, 8/2000 – 6/2002: "Modeling Physical Vapor Deposition for Thin-Film Production."
7. Orlando Ayala, 1/1999 – 8/2001: "CFD Modeling of Compressible Turbulence in Gas Turbine."
8. Adrian Gorea, 9/1997 – 1/1999: "Drag and Heat Transfer in Laminar Flows around arbitrarily Shaped Body: A Virtual Boundary Approach."

Undergraduate students for whom I have served (or am serving) as research advisors:

1. Nick Geneva, 9/2014 – : "MPI implementation of lattice Boltzmann method for particle-laden turbulent flows", Nick was Engineering Research scholar in Summer 2015.
2. Marcio Holanda Souto, 6/2015 – 8/2015: "Theoretical and computational study of circular Couette flow"
3. Yuntian Bo (A visiting scholar – senior student from Peking University), 2015: "Parallel implementation and validation of a discrete unified gas kinetic scheme for turbulent flow simulation"
4. Yihua Teng (Exchange student to UD from Peking University), 2014: "Lattice Boltzmann simulations of moving particles in viscous flow: implementation issues and benchmark cases"
5. Brian Hwang, 2013: "LBM Simulations of compressible multiphase flows"
6. Kevin Matthews, 2012: "Parallel implementation of 3D particle-resolved, particle-laden turbulence"
7. Yucan Zhu, summer 2012, visiting student from Tsinghua University, "Particle-resolved simulation using lattice Boltzmann approach"
8. Zhao Pan, summer 2012, Brigham Young University, "Study of bubbly dynamics using lattice Boltzmann approach"
9. Sean Deffler, 2011: "Parallel implementation of 3D particle-resolved, particle-laden turbulence"
10. Charles Andersen, 2010 - 2012: "Parallel implementation of Lagrangian colloids tracking". Supported by NSF Petascale cloud droplet summer high-performance computing fellowship.

11. Peter John, 2007-2008: "Simulations of complex flow and mixing in a curved pipeline." Went to U. of North Carolina at Wilmington for masters degree in Applied Math.
12. Scott Johnson, 2006: "Methods to monitor particle clustering in turbulence and comparison with observations."
13. Scott Kasprzak, 2003-2004: "3D animation of particle-laden turbulent flows using open-source Linux-based packages (VTK)." Went to George Tech. Engineering School for Ph.D.
14. Joseph P. Feser, 2003: "Development and construction of a cloud chamber." Went to UC Berkeley for Ph.D. study.
15. Scott Kasprzak, 2002: "3D animation of particle-laden turbulent flows using PV Wave." Went to George Tech. Engineering school for Ph.D.
16. Anthony Di Stasio, Fall 2002, Independent Study and Research: Solar Decathlon Engineering Issues.
17. Jennifer Paulin, 9/1997–5/1998: "Experiments and simulations of gas-solid fluidized bed."
18. Jennifer Paulin, Fall 1997. Independent study: Heat Transfer

Recent awards to students in my research group:

1. Cheng Peng, The 2016-2017 Graduate University Fellow Award, 2016
2. Nick Geneva, NASA DE Space Grant Undergraduate Tuition Award ($5,000), 2016
3. Nick Geneva, UD Summer Research Scholar award, 2016
4. Nick Geneva, APS DFD student travel award ($500) to undergraduate researcher, 2015
5. Cheng Peng, 2015 NSF Travel Award to ICMMES meeting in Beijing, China.
6. Haoda Min, 2015 NSF Travel Award to ICMMES meeting in Beijing, China.
7. Nick Geneva, UD Summer Research Scholar award, 2015
8. Cheng Peng, 2014 NSF Travel Award to ICMMES meeting in New York.
9. Queming, Qiu, 2012-2013, UD Dissertation Fellow
10. Xiaoyan, Shi, 2010-2011, UD Dissertation Fellow

Courses Taught

I have taught the following list of courses at UD:

2016	Spring	MEEG342	Heat Transfer	3 credits	118 students
2015	Fall	MEEG837	Multiphase Flow & Transport	3 credits	8 students
2015	Spring	MEEG342	Heat Transfer	3 credits	99 students
2014	Fall	MEEG833	Mesoscopic CFD method	3 credits	6 students
2014	Spring	MEEG342	Heat Transfer	3 credits	98 students
2013	Fall	MEEG833	Mesoscopic CFD method	3 credits	6 students
2013	Spring	MEEG837	Multiphase Flow & Transport	3 credits	7 students
2012	Fall	MEEG341	Thermodynamics	3 credits	68 students
2012	Spring	MEEG833	Mesoscopic CFD method	3 credits	9 students
2011	Fall	MEEG341	Thermodynamics	3 credits	109 students
2011	Spring	MEEG667/467	Comput. Multiphase Flow	3 credits	15 students
2010	Fall	MEEG341	Thermodynamics	3 credits	123 students

2009	Spring	MEEG837	Multiphase Flow & Transport	3 credits	6 students
2009	Spring	MEEG833	Mesoscopic CFD method	3 credits	8 students
2008	Fall	MEEG341	Thermodynamics	3 credits	80 students
2008	Spring	MEEG344	Thermodynamics	3 credits (2)	72 students
2007	Fall	MEEG/MAST467/667	Intro to GFD	3 credits	12 students
2007	Spring	MEEG344	Thermodynamics	3 credits (2)	75 students
2007	Spring	MEEG102	Intro to ME Lab	1 credit	78 students
2006	Fall	MEEG681/481	Computer Soln of Engr Probs	3 credits	24 students
2006	Fall	MEEG637	Two Phase Flows	3 credits	7 students
2006	Spring	MEEG344	Thermodynamics	3 credits (2)	73 students
2006	Spring	MEEG102	Intro to ME Lab	1 credit	118 students
2005	Fall	MEEG681/481	Computer Soln of Engr Probs	3 credits	15 students
2005	Spring	MEEG344	Thermodynamics	3 credits	69 students
2005	Spring	MEEG342	Heat Transfer	3 credits	69 students
2005	Spring	MEEG102	Intro to ME Lab	1 credit	115 students
2004	Spring	MEEG681	Computer Soln of Engr Probs	3 credits	9 students
2004	Spring	MEEG867	Lattice Boltzmann Approach	3 credits	6 students
2004	Spring	MEEG167	Intro to ME Lab	1 credit	105 students
2003	Fall	MEEG637	Two Phase Flows	3 credits	4 students
2002	Spring	MEEG467	Solar Powered Homes	3 credits	14 students
2002	Spring	MEEG681/481	Computer Soln of Engr Probs	3 credits	11 students
2001	Fall	MEEG637	Two Phase Flows	3 credits	6 students
2001	Spring	MEEG681/481	Computer Soln of Engr Probs	3 credits	9 students
2000	Fall	MEEG630	Intermediate Fluid Mechanics	3 credits	16 students
2000	Spring	MEEG342	Heat Transfer	3 credits	37 students
2000	Spring	MEEG681/481	Computer Soln of Engr Probs	3 credits	17 students
1999	Fall	MEEG630	Intermediate Fluid Mechanics	3 credits	16 students
1999	Spring	MEEG467/667	Computer Soln of Engr Probs	3 credits	27 students
1998	Fall	MEEG307	Thermodynamics I	3 credits	37 students
1998	Spring	MEEG467/667	Computer Soln of Engr Probs	3 credits	19 students
1997	Fall	MEEG307	Thermodynamics I	3 credits	55 students
1997	Spring	MEEG667	Two Phase Flows	3 credits	5 students
1996	Fall	MEEG307	Thermodynamics I	3 credits	47 students
1996	Spring	MEEG832	Fluid Dynamics	3 credits	10 students
1995	Fall	MEEG307	Thermodynamics I	3 credits	40 students
1995	Spring	MEEG832	Fluid Dynamics II	3 credits	9 students
1994	Fall	MEEG307	Thermodynamics I	3 credits	54 students

Notes: In the preceding list, the courses that I co-taught are MEEG/MAST467/667 (Intro to GFD), MEEG467 (Solar Powered Homes), MEEG167 (Intro to ME Lab), MEEG102 (Intro to ME Lab), and MEEG342 (Heat transfer, in 05S).

I taught a distant-learning course "MEEG630 Intermediate Fluid Mechanics" in 15F, 15J, 15S, 14F, 14S, 13J 13S, 11F, 09S, 08F, 08S, 07F, 07S, 06F, 05S, 04F, 04S, 02S, 01F, 01S, and 00F to a total of 53 students.

I also taught the following course at Washington State University:

1990	Spring	ME301	Thermodynamics II	3 credits	45 students

University Services

9/2016 -	Member, Department Faculty Search Committee
9/2015 -	Faculty Senate Research Committee, review UD GUR program and proposals
2013-	Chair, Department P&T Committee
2014-	Member, Graduate Education Committee
2013-	Advisor, Society of Asian Scientists and Engineers
2010-2013	College of Engineering Promotion & Tenure Committee
2010-2014	ME Graduate Committee (Chair, Santare; members, Wang, Suhr, Roy)
9/2010 -	Mentor for MEEG junior faculty
2009 -	Department representative of UD Graduate Certificate program on Computational Science and Engineering (CSE): develop and update policy and documents related to the certificate, supervise interest students.
2005-	Member, University Committee on Instructional Computing and Research Support Services: Discuss general issues relevant to the university such as: a) the per-student per-credit distance learning payment model; (2) open publishing; (3) the information technology, and (4) media services.
2012-2013	Chair, ME Faculty Search Committee (Members: Prasad, Hertz, L.Y. Wang)
2013	Member, ME Chair Search Committee (Chair, Shenton; Buckley, Buchanan, Chou, Burris, Wang)
2010-2011	Chair, ME Faculty Search Committee (Members: Advani, Prasad, Higginson, L.Y. Wang, Tanner)
9/2010-5/2015	College contact person to lead the development of a partnership with Peking University: (1) participated in discussions at Peking University involving UD administration and department chair and colleague, (2) Initiated and hosted an exchange visit by Prof. Pingchu Han of Peking University in 9/2010, (3) developed a general university MOU document, (4) developed a specific college to college agreement, and (5) advise students from PKU.
2009-2011	Member, College of Engineering Cluster Search Committee (Computer and IT), Chair Chien-Chung Shen (CIS), Anthony Beris (ChE), Jim Kirby (CEE), Fouad Kiamilev (ECE), Lian-Ping Wang (ME)
2010 -2013	Mentor for Junior faculty Erik Thostenson
2008-09	Member of Mechanical Engineering Faculty Search Committee.
2007-2009	Chair, ME Dept. Undergraduate Lab Committee, Overseeing ABET issues and teaching lab improvements.
2007-08	Co-led an ad-hoc university committee (with Prof. David Legates of Geography and Prof. Denny Kirwan of the College of Earth and Marine Studies) to develop an application for the University of Delaware to join UCAR (University Corporation for Atmospheric Research), planned and hosted an on-site visit on April 16, 2007 by the UCAR team. I also prepared an overview presentation for research in the College of Engineering with inputs from 9 CE faculty members. These eventually led to the university to formally become a UCAR member university in October 2007.

2005-2009	University Faculty Senator.
2005-07	Mechanical Engineering Computer Committee (Chair).
2005-06	Clean Energy Faculty Search Committee; Undergraduate Design Committee.
2004-05	Bill N. Baron Fellowship Award Committee (Chair); Computer Committee (Chair); University Committee on Undergraduate Records and Certification; University Instructional Computing Committee; eCALC Committee;
2003-04	University Committee on Undergraduate Records and Certification; College Cluster Computing Group; Biomechanics Search Committee; Coordinator for MATH352/353; Department Computer Committee (chair).
2002-03	Coordinator for MATH352/353; Annual appraisal for Mr. Byrnes.
2001-02	UD Solar Decathlon: This is probably the largest student project in recent history at UD. I served as the Faculty Director for the UD team with 60 students and 16 faculty/staff. Our team successfully designed and built a solar home which became one of the 14 entries for the Solar Decathlon event held on the National Mall in Washington D.C., in Sept-Oct, 2002. The project started in June 2001 and involved a variety of activities spanning over teaching, research, and service. I, teamed with Ajay Prasad and Jim Glancey, oversaw all aspects of the project, including proposal writing, organization, strategic planning, design and analysis, communications (with sponsors, professionals, students, advisors, and the Headquarters), fund-raising, field trips, meetings and presentations, publicity, *etc.* I also organized 4 educational seminars in Fall 2001 for the Solar Decathlon students. The project had raised over $200,000 in-kind contributions and monetary support. The UD Solar House has now become an important part of the newly-built, Innovation Technology and Exploration Center by the Delaware Aerospace Education Foundation, at Big Oak Road in Smyrna, Delaware. It is expected that the UD Solar House will serve the public at large for many years to come.
2001-02	University Senate Committee on Instructional, Computing, and Research Support Services; Solid Mechanics Faculty Search Committee; Department Seminar Series (chair); Computer Committee (chair).
2000-01	RISE 2000 8th Annual Achievement Convocation; Department Seminar Series (chair); Computer committee (chair).
1999-00	Computer Committee (chair); Department Web Committee (Chair); Ph.D. Qualifiers coordinator (Fluids).
1998-99	Computer Committee (chair), Department Web Committee (Chair), College Computer Support Search Committee.
1997-98	Fluids Particulate and Environmental Systems Seminar Committee (Chair), Computer Committee (chair); University Supercomputing Committee.
1996-97	Fluids Particulate and Environmental Systems Seminar Committee (Chair), Computer Committee; Graduate Curriculum Committee.
1995-96	Fluids Particulate and Environmental Systems Seminar Committee (Chair), Computer Committee, Ad-hoc College Computing Committee.
1994-95	Fluids Particulate and Environmental Systems Seminar Committee (Chair), Computer Committee; Engineering Outreach Workshop.

In addition, I have participated regularly in Engineering Open House, Delaware Discovery Days, B&G Saturdays, Delaware Decision Days, etc.

Service to The Professional Society

Journal editorship

4/2014 – , Northern America Regional Editor, *Journal of Thermal Engineering*.

6/1/2012 – , Member of Editorial Board, *ISRN Atmospheric Sciences*, International Scholarly Research Network.

11/15/2011 – , Member of Editorial Board, *Open Journal of Fluid Dynamics*, Scientific Research Publishing Inc.

9/2007 –, Associate Editor, *International Journal of Engineering Systems Modelling and Simulation,* InderScience Publishers.

Organizer and Committee

Member of ICMF-2016 Scientific Committee, 2015-2016 (International Conference on Multiphase Flow, May 22 – May 27, 2016, Firenze, Italy.

One of the organizers for 16TH INTERNATIONAL SYMPOSIUM ON GAS-PARTICLE FLOWS, ASME/KSME/JSME Joint Fluids Engineering Conference, Seoul, South Korea, July 26–31, 2015.

Member of the Program and Expert Committee, International Conference on Computational and Informational Technologies in Science, Technologies and Education – 2015, 24-27 September 2015, Almaty, Kazakhstan.

Co-organizer (with Prof. Zhaoli Guo of Huazhong U of Sci. & Tech.), International Symposium on Environmental Multiphase Flows, May 29-30, 2015, Wuhan, China.

Co-organizer (with Prof. Zhaoli Guo of Huazhong U of Sci. & Tech.), Summer School on Environmental Multiphase Flows, May 27-28, 2015, Wuhan, China.

Co-organizer (with Prof. Zhaoli Guo of Huazhong U of Sci. & Tech.), Summer School on Fundamental Issues of Multiphase Flows, June 9-12, 2014, Wuhan, China.

Co-organizer (with Prof. Zhaoli Guo of Huazhong U of Sci. & Tech.), International Symposium on Fundamental Issues of Multiphase Flows, June 13-14, 2014, Wuhan, China.

Member of APS/DFD Program Committee, 2013-2015. Responsible for the selection of invited talks and minisymposia and the arrangement of the programs of such meetings. The Program Committee works with the Local Organizing Committee to make recommendations on important matters related to DFD annual meetings. Chaired by Jim Duncan (U. Maryland), Members: Nadine Aubry (Northeastern U), Wendy Zhang (U Chicago), Andrew Belmonte (PSU), Daniel Bodony (UIUC), Eric Lauga

(UCSD), J Posner (U. Washington, micro- and nano scale transport physics), Lian-Ping Wang (U. Delaware)

Co-organizer (with Prof. Zhaoli Guo of Huazhong U of Sci. & Tech.), International Symposium on Turbulent Particle-laden Flow and Coal Combustion, June 2-5, 2013, Wuhan, China.

Member of Scientific Committee, 1st International Conference on Frontiers in Computational Physics: Modeling the Earth System. 16-20 December 2012, National Center for Atmospheric Research, Boulder, Colorado, USA.

Co-organizer (with W.W. Grabowski, P. Sullivan, H. Jonker), Workshop on Turbulent Multiphase Flow in Geophysics (sponsored by NCAR), August 13-17, 2012.

Member of Local Organizing Committee, APS 64th Annual DFD Meeting, Baltimore, Maryland, November 20-22, 2011.

Organizer, Workshop on Multiscale Computing of Cloud Physics, August 15, 2011, University of Delaware.

Organizer, Workshop on Multiscale Computing of Cloud Physics, August 16-17, 2010, University of Delaware.

Member of ICMF-2010 Scientific Committee, 2009-2010 (International Conference on Multiphase Flow, May 30 - June 4, 2010, Tampa, Florida, USA).

Organized a panel session on "*Learning and Doing: The Solar Decathlon*", AAUP 89th Annual meeting "Liberal Education and Social Responsibility", Washington D.C., June 11-15, 2003. With P. Paxton Marshall (University of Virginia) and Henry W. Brandhorst, Jr. (Auburn University). June 13, 2003.

Organized and chaired a panel session on "*Special Application of Multiphase Flow: Aerosol and Air Pollution,*" 4th International Conference on Multiphase Flow, New Orleans, LA, June 1, 2001.

Session chairman and panel discussion at scientific conferences

Session Chair, Invited talk *"GPUs Renovating Computing",* The 25th International Conference on "Discete Simulation of Fluid Dynamics (DSFD2016)", Shenzhen, China, July 7, 2016.

Session Chair, Invited talk *"Voretx-like motions and enhanced thermal prooerties of dense granular media",* The 25th International Conference on "Discete Simulation of Fluid Dynamics (DSFD2016)", Shenzhen, China, July 7, 2016.

", The 25th International Conference on "Discete Simulation of Fluid Dynamics (DSFD2016)", Shenzhen, China, July 7, 2016.

Session Chair, *Particles,* The 25th International Conference on "Discete Simulation of Fluid Dynamics (DSFD2016)", Shenzhen, China, July 7, 2016.

Session Chair, *PDF model and two-fluid models.* Workshop in memory of Zaichik on "Contemporary Methods for Multiphase Turbulent Flows Modeling"*,* Moscow, May 30, 2016.

Session Chair, *Session on "Collision, Agglomeration and Breakup",* The 9th International Conference on Multiphase Flow, Firenze, Italy, 5/24/2016.

Session Chair, Session "A21 Turbulence: Environmental Flows", Sunday, 22/11/2015, American Physical Society, Division of Fluid Dynamics, Boston.

Session Chair, Session "SPH, DPD, and related methods", Thursday, 23/Jul/2015: 9:00am - 11:00am, The 12th International Conference for Mesoscopic Methods in Engineering and Science, Beijing, China, 7/2015.

Session Chair, S32-1, International Symposium on Gas-Particle Flows 1, International conference on Multiphase Flow, Coex, Seoul, Korea, July 26-31, 2015.

Session Chair, "*Open Forum Fluid-Particle Interactions in Turbulence I*", ASME Fluids Engineering Division Summer Meeting, Chicago, August 4, 2014.

Session Chair, "*Session* C3: Suspensions and particulates II session*",* The 11th International Conference for Mesoscopic Methods in Engineering and Science, New York, USA, 7/2014.

Session Chair, *Session on "Particle-laden flows",* International conference on Multiphase Flow, Jeju, Korea, 5/2013.

Session Chair, *Oral Session 2,* at *the 1st International Conference on Frontiers in Computational Physics: Modelling the Earth System*, Boulder, CO, USA, 12/17/2012.

Session Chair, *Session on "NU6B - Numerical simulations",* The 9th European Fluid Mechanics Conference, Rome, Italy, 9/12/2012.

Session Chair, *Session on "Particulate / Colloidal Flows II",* The 9th International Conference for Mesoscopic Methods in Engineering and Science, Taipei, Taiwan, 7/2012.

Session Chair, Session Mo4B, Environmental two-phase flows, The 13th European Turbulence Conference, Warsaw, Poland, 9/12/2011

Session Chair, *Science Authorship Panel with Dr. Beverly Purnell, Sr. Editor, Science and UD Faculty*, Workshop on *Responsible Conduct of Research 2011*, University of Delaware, 2/2/2011

Session Chair, *Session on "Numerics, Models, and Algorithms I",* The 7th International Conference for Mesoscopic Methods in Engineering and Science, Edmonton, Alberta, Canada, 7/2010.

Session Chair, *Session on "Colloidal and Suspension Dynamics",* International conference on Multiphase Flow, Tampa, Florida, 6/2010.

Chaired Keynote presentation by Alfredo Soldati*,* International conference on Multiphase Flow, Tampa, Florida, 6/2010.

Session on "Complex/Bio Fluids", The 6th International Conference for Mesoscopic Methods in Engineering and Science, Guangzhou, Guang Dong, China, 7/2009.

Session on "Clouds and Turbulence", The 4th IMS Turbulence Workshop, Institute for Mathematical Sciences, Imperial College, London, 3/2009.

Session on Modeling Complex and Multiphase Flows, International Conference on Applied Mathematics: Modeling, Analysis and Computation, Hong Kong, 6/2008.

Session on Particle-Interaction, International conference on Multiphase Flow, Leipzig, Germany, 7/2007

Multiphase Flows II, APS/DFD meeting in Chicago, 11/2005

Micro, Nano Particle and Bubble II, The 5th International conference on Multiphase Flow, Yokohama, 6/2004

Aerosol Physics–Coagulation / Agglomeration, Annual meeting of the American Association for Aerosol Research, 11/1999

Particle-laden and Multiphase Flows, American Physical Society, Division of Fluid Dynamics, 11/1998

Particle Dispersion, Int. Sym. on Numerical Methods in Multiphase Flows, ASME Fluids Engineering conference, 6/1998

Simulation of Gas-Particle Flows, Symposium on Gas-Solid Flow, ASME Fluids Engineering conference, 6/1997

Direct Numerical Simulation, American Physical Society, Division of Fluid Dynamics, 11/1996

Gas-Particle Flows, Symposium on Gas-Solid Flow, ASME Fluids Engineering conference, 8/1995

Particle-Laden Shear Flows, Sym. on Turbulence Structure & Flow Control, SES Annual Conference, 10/1995

Reviewer for the following journals (Currently I review 15 to 20 manuscripts per year**)**

1. Acta Mechanica Sinica
2. Aerosol Science and Technology
3. AIAA Journal
4. ASCE J. of Hydraulic Engineering
5. ASME J. of Fluids Engineering
6. Chinese J. of Theoretical and Applied Mechanics
7. Composites, Part A.
8. Computers & Fluids
9. Computers & Mathematics with Applications
10. Deep-Sea Research
11. European Journal of Mechanics
12. Europhysics Letters
13. Experiments in Fluids
14. Geophysical Research Letters
15. Heat and Fluid Flow
16. Int. J. of Comp. Fluid Dyn.
17. Int. J. of Engr. Systems Modelling and Simulation
18. Int. J. of Multiphase Flow
19. J. Applied Meteorology
20. J. Atmospheric Sciences
21. J. Comp. Physics
22. J. Fluid Mechanics
23. J. Composites A
24. J. Fluids Engineering
25. J. Geophysical Research: Ocean
26. J. Marine Research
27. J. of Meteorology
28. J. Rheology
29. J. Plasma Physics
30. J. Turbulence
31. J. Zhejiang University Science
32. New J. Physics
33. Numerical Heat Transfer
34. Physics of Fluids
35. Powder Technology
36. The Royal Society Proceedings A
37. Vadose Zone Journal

Reviewer for the following funding agencies

National Science Foundation (CTS Division, ATM Division)
National Science Foundation (SBIR, POWRE panels)
Cornell Supercomputing Center
The Research Council of Norway
Icelandic Research Fund
The Israel Science Foundation
National Science Centre, Poland
The Netherlands Organisation for Scientific Research (NWO)
U.S. Civilian Research and Development Foundation
U.S. Army Corps of Engineers Engineer Research and Development Center
Dutch Technology Foundation STW

Reviewer for the following publishing companies

Cambridge University Press: Heat Transfer Textbook (3rd ed), by Professors John Lienhard IV and John Lienhard V.
Cambridge University Press: An introduction to continuum mechanics with applications, by J.N. Reddy

Consulting

Schlumberger	Simulating viscous flow in a wavy tube	2007 – 2010
Jonas Inc.	Simulating particle transport in a turbulent flow	2001 – 2006
CFD Research Corporation	Multiphase flow modeling	1995 – 1996
Los Alamos National Lab	Parallel computation of turbulence	1993 – 1995

Public Services

Chair, School Council, First State Chun Hui Chinese School, Hockessin, DE, 2012-2014.

Vice Chair, School Council, First State Chun Hui Chinese School, Hockessin, DE, 2011-2012.

Assistant Principal of Academics, First State Chun Hui Chinese School, Hockessin, DE, 2010-2011.

Board Member of Delaware Chinese American Association, 2006-2014

Member of Advisory Board, University of Delaware Lab Preschool, 2006-2008