Curriculum Vitae

Guang Lin

CONTACT INFORMATION

Division of Applied Mathematics
Box F, Brown University
182 George Street
Providence, RI 02912, U.S.A.

Phone: 401-863-3694
glin@dam.brown.edu
http://www.dam.brown.edu/people/glin/

EDUCATION

Ph.D. in Applied Mathematics, May 2007
Brown University, Providence, RI, U.S.A.
Advisor: Prof. George Em Karniadakis
Thesis: Numerical Solvers for Stochastic Compressible Navier-Stokes and MHD Equations

M.Sc., in Applied Mathematics, May 2004
Brown University, Providence, RI, U.S.A.

M.Sc., in Mechanics, July 2000
Peking University, Beijing, P. R. China

B.S., in Mechanics, July 1997
Zhejiang University, Hangzhou, P. R. China

RESEARCH

- Modelling uncertainty in compressible and MHD flow.
  - High-order numerical methods for stochastic problems:
    - Generalized polynomial chaos.
    - Multi-element generalized polynomial chaos.
    - Multi-element probabilistic collocation method on sparse grids.
  - Prototype problems:
    - Stochastic piston problem.
    - Stochastic random inflow and random oscillation in supersonic flow.
    - Lift enhancement due to stochastic roughness in supersonic flow past a wedge.
    - Stochastic simulations of supersonic flow past a rough cone.
- Stochastic perturbation analysis.
- Discontinuous Galerkin spectral/hp methods.
- Large-scale parallel scientific computing.
- High-order MHD simulations and divergence cleaning techniques.
- Numerical simulations of micro-scale flows (MEMS).
- Spectral/*hp* element and high-order finite-element methods.

- High-order numerical methods (ENO, WENO) for conservation laws.

PUBLICATIONS AND PREPRINTS IN REFEREED JOURNALS

1. G. Lin , C.-H. Su and G.E. Karniadakis, "Scattering of shock waves by random roughness", *Proceedings of the National Academy of Sciences of the United States of America, in review.*
2. G. Lin, C.-H. Su and G.E. Karniadakis, "The stochastic piston problem", *Proceedings of the National Academy of Sciences of the United States of America, Vol 101, No. 45: 15840-15845, 2004.*
3. G. Lin, X. Wan, C.-H. Su and G.E. Karniadakis, "Stochastic fluid mechanics", *IEEE Computing in Science and Engineering (CiSE), in print.*
4. G. Lin, C.-H. Su and G.E. Karniadakis, "Predicting shock dynamics in the presence of uncertainties", *Journal of Computational Physics, special issue in Uncertainty Quantification, Vol 217, Issue 1, 1 September 2006, Pages 260-276* .
5. G. Lin and G.E. Karniadakis, "A discontinuous Galerkin method for two-temperature plasmas", *Computer Methods in Applied Mechanics and Engineering, special issue in discontinuous Galerkin methods, Vol 195, Issues 25-28, 1 May 2006, Pages 3504-3527.*
6. G. Lin and L. Grinberg and G.E. Karniadakis, "Numerical studies of the stochastic Korteweg-de Vries equation", *Journal of Computational Physics, Vol 213, Issue 2, 10 April 2006, Pages 676-703.*

PUBLICATIONS IN PREPARATION

1. G. Lin , C.-H. Su and G.E. Karniadakis, "High-order numerical method for stochastic roughness problem".
2. G. Lin , C.-H. Su and G.E. Karniadakis, "Numerical simulations of supersonic flow past a rough cone".

CONFERENCE PUBLICATIONS (abstract peer reviewed)

1. G. Lin, C.-H. Su and G.E. Karniadakis, "Roughness can enhance lift", $45th$ AIAA Aerospace Sciences Meeting and Exhibit, January 2007, Reno, NV.
2. G. Lin, C.-H. Su and G.E. Karniadakis, "Modeling uncertainties in supersonic flow past a wedge", AIAA-2006-0124, $44th$ AIAA Aerospace Sciences Meeting and Exhibit, January 2006, Reno, NV.
3. G. Lin, C.-H. Su and G.E. Karniadakis, "Stochastic solvers for the Euler equations", AIAA-2005-0873, $43rd$ AIAA Aerospace Sciences Meeting and Exhibit, January 2005, Reno, NV.
4. G. Lin and G.E. Karniadakis, "High-order modeling of micro-pulsed plasma thrusters", AIAA-2002-2872, $3rd$ AIAA Theoretical Fluid Mechanics Meeting, June 2002, St. Louis, Missouri.

5. G. Lin and G.E. Karniadakis, "A high-order discontinuous Galerkin method for modeling micro-pulsed plasma thrusters", IEPC-01-154, 27th International Electric Propulsion Conference, October 2001, Pasadena, CA.

CONFERENCES

- Speaker:
  - Guang Lin, Topic: "Random roughness can enhance lift", will present at the 45th AIAA Aerospace Science Meeting and Exhibit, January 08-11, 2007, Reno, NV.
  - Guang Lin, Topic: "Stochastic analysis and simulation of random roughness in shock dynamics ", SIAM Annual Meeting July 10-14, 2006, Boston, MA.
  - Guang Lin, Topic: "Modeling uncertainties in supersonic flow past a wedge", presented at the 44th AIAA Aerospace Science Meeting and Exhibit, January 09-12, 2006, Reno, NV.
  - Guang Lin, Topic: "Stochastic solvers for the Euler equations", presented at the 43rd AIAA Aerospace Science Meeting and Exhibit, January 10-13, 2005, Reno, NV.
  - Guang Lin, Topic: "A discontinuous Galerkin method for two-temperature plasmas", presented at the Mini-Symposium on Discontinuous Galerkin Methods for Computational Mechanics, the 7th US National Congress on Computational Mechanics, July 27-31, 2003, Albuquerque, NM.
  - Guang Lin, Topic: "High-order modeling of micro-pulsed plasma thrusters", presented at the 3rd AIAA Theoretical Fluid Mechanics Meeting, June 24-26, 2002, St. Louis, Missouri.
  - Guang Lin, Topic: "A high-order discontinuous Galerkin method for modeling micro-pulsed plasma thrusters", presented at the 27th International Electric Propulsion Conference, October 15-19, 2001, Pasadena, CA.
- Participant:
  - 2006 SPDE workshop on advances and challenges in the solution of stochastic partial differential equation, October 20-22, 2006, Brown University, Providence, RI.
  - Introduction to the Cray XT3 workshop, Pittsburgh Supercomputer Center, August 9-12, 2005, Pittsburgh, PA.
  - The 6th international conference on spectral and high-order methods (ICOSAHOM), June 21-25, 2004, Brown University, Providence, RI.
  - The 18th international conference on the numerical simulation of plasmas (ICNSP), September 7-10, 2003, Falmouth, MA.

WORK AND TEACHING EXPERIENCE

Brown University, Division of Applied Math. — Providence, RI, USA
Research Assistant — 2000 - present
Professor George Em Karniadakis.

Brown University, Division of Applied Math
Teaching Assistant Spring 2004
AM65: Essential Statistics. Professor Donald McClure. *Undergraduate Course*

Brown University, Division of Applied Math.
Teaching Assistant Fall 2004
AM117: Introduction of Numerical Analysis. Professor George Em Karniadakis. *Undergraduate and Graduate Course*

Brown University, Division of Applied Math.
Computer Teaching Assistant Fall 2004
Computer Assistant for all undergraduate courses opened by Applied Math.

AWARDS

- Ostrach Fellowship, Division of Applied Math, Brown University, Fall 2005.

AFFILIATIONS

- Member, The American Mathematical Society.
- Member, The Society for Industrial and Applied Mathematics.
- Member, The American Institute of Aeronautics and Astronautics.

REVIEWER

- Journal of Computational Physics.

COMPUTER SKILLS

- Excellent command of programming languages: C/C^{++}, Fortran, Java, MPI and other packages: Matlab, Maple and Mathematica, Gridgen, Tecplot, Paraview etc.
- Experienced user of Unix, Linux and Windows.

REFERENCES

- Professor George Em Karniadakis - *Advisor*
  Division of Applied Mathematics, Brown University
  182 George ST
  Providence, RI 02912
  Tel: (401) 863-1217; Email: gk@dam.brown.edu
- Professor Chau-Hsing Su - *Co-Advisor*
  Division of Applied Mathematics, Brown University
  182 George ST
  Providence, RI 02912
  Tel: (401) 863-1447; Email: Chau-Hsing_Su@brown.edu

- Professor Chi-Wang Shu
  Division of Applied Mathematics, Brown University
  182 George ST
  Providence, RI 02912
  Tel: (401) 863-2549; Email: shu@dam.brown.edu