Curriculum Vita

Xinfeng Liu, Ph.D.

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EDUCATION:

Ph.D. in Applied Mathematics, May 2006
Department of Applied Mathematics and Statistics
State University of New York at Stony Brook
Dissertation: Turbulent Mixing with Scale Breaking Phenomena
(Advisor: James Glimm)

M.S. in Applied Mathematics, June 1999
Department of Applied Mathematics
Southeast University, Nanjing, China
Thesis: The Critical Exponent of Doubly Singular Parabolic Equations
(Advisor: Mingxin Wang)

B.S. in Applied Mathematics, June 1997
Department of Mathematics
Fudan University, Shanghai, China

PROFESSIONAL APPOINTMENTS:

Visiting Assistant Professor of Mathematics,
July 2006---present
University of California at Irvine, Irvine, CA

AFFILIATIONS and HONORS:

- Society for Industrial and Applied Mathematics
- Society for Mathematical Biology
- Graduate Council Commendation to Distinguished Doctoral Students, State University of New York at Stony Brook, Stony Brook, NY, 2006
- SIAM Student Travel Awards, Society for Industrial and Applied Mathematics, New Orleans, LA, 2005
- Sigma Xi Travel Awards, State University of New York at Stony Brook, Stony Brook, NY, 2005
- Peijing Scholarship, Southeast University, Nanjing, China, 1999

EXPERIENCE:

07/06–present Department of Mathematics,
University of California at Irvine, Irvine, CA
Visiting Assistant Professor

- Developing and implementing an efficient and effective numerical algorithm to solve reaction-diffusion systems.
- Developing mathematical models to study the signal transduction through signaling pathways.
- Analyzing the data from both simulations and experiments using statistical tools.
- Conducting parallel and large scale scientific computing.
- Teaching both graduate and undergraduate courses, and grading homework and exams.

09/00-06/06 Department of Applied Mathematics and Statistics,
State University of New York, Stony Brook, NY
Research Assistant/Teaching Assistant

- Developed a leading numerical method for the computation of unstable material interfaces.
- Applied the physical models, such as physical surface tension and mass diffusion, to study the fluid mixing numerically.
- Proposed an analytical model to study the multiphase flow.
- Developed a novel numerical approach to investigate the physical conservation laws.
- Delivered class lectures, and graded homework and exams.

09/97-06/00 Department of Applied Mathematics,
Southeast University, Nanjing, China
Research Assistant

- Developed a novel approach to prove the existence and uniqueness of the solutions to partial differential equations.

PUBLICATIONS

Journal Articles

1. Q. Nie, F. Y.M. Wan, Y. T. Zhang, **X. F. Liu** (2008). Compact integration factor methods in high spatial dimensions. *Journal of Computational Physics, Accepted*.

2 W. Bo, H. Jin, D. Kim, **X. F. Liu**, H. Lee, N. Pestieau, Y. Yu, J. Glimm, J. Grove (2008). Comparison and Validation of Multi Phase Closure Models. *Computers and Mathematics with Applications, Accepted.*

3 **X. F. Liu**, Y. H. Li, J. Glimm, X. L. Li (2007). A front tracking algorithm for limited mass diffusion. *Journal of Computational Physics 222(2), 644-653.*

4 Z. L. Xu, J. Glimm, Y. M. Zhang, **X. F. Liu** (2007). A multiscale front tracking method for compressible free surface flows. *Chemical Engineering Science 62(13), 3538-3548.*

5 **X. F. Liu**, E. George, W. Bo, J. Glimm (2006). Turbulent mixing with physical mass diffusion. *Physical Review E. 73, 056301.*

6 E. George, J. Glimm, X. L. Li, Y. H. Li, **X. F. Liu** (2006). The influence of scale-breaking phenomena on turbulent mixing rates. *Physical Review E. 73, 016304.*

7 H. Jin, **X. F. Liu**, T. Lu, B. Cheng, J. Glimm, D. Sharp (2005). Rayleigh-Taylor mixing rates for the compressible flow. *Physics of Fluids 17, 024104.*

8 **X. F. Liu**, M. X. Wang (2001). The Critical Exponent of Doubly Singular Parabolic Equations. *Journal of Mathematical Analysis and Applications 257, 170-188.*

Conference and Refereed Proceedings

1. W. Bo, B. Cheng, J. Du, B. Fix, E. George, J. Glimm, J. Grove, X. Jia, H. Jin, H. Lee, Y. Li, **X. F. Liu**, D. H. Sharp, L. Wu, Y. Yu (2007). Recent Progress in the Stochastic Analysis of Turbulent Mixing. *Contemporary Mathematics 429, 33-44.*

2. J. Glimm, B. Fix, J. Liu, **X. F. Liu**, T. Lu, R. Samulyak, Z. Xu (2006). Front Tracking under TSTT. *Numerical Modeling of Space Plasma Flows (Astronum-2006 ASP Conference Series) 359, 15.*

3. B. Fix, J. Glimm, X. Li, Y. Li, **X. F. Liu**, R. Samulyak (2005). A TSTT integrated FronTier code and its applications in computational fluid physics. *Journal of Physics (Conference Series) 16, 471-475.*

Submitted Papers

1. **X. F. Liu**, Q. Nie (2008). An implicit integration factor method with adaptive mesh refinement. *Preprint.*

2. **X. F. Liu**, L. Bardwell, R. D. Moore, Q. Nie (2008). Spatially localized scaffold proteins may simultaneously boost and suppress signaling. *Preprint.*

3. **X. F. Liu**, L. Bardwell, Q. Nie (2008). Scaffold binding with multi-site protein phosphorylation may produce switch like responses. *Preprint*.

PRESENTATIONS and INVITED TALKS

1. "Turbulent mixing with scale breaking phenomena". (Invited) talk at Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN, March 2006.

2. "Turbulent mixing with scale breaking phenomena". (Invited) talk at Department of Mathematics, University of Central Florida, Orlando, FL, Feb. 2006.

3. "Turbulent mixing with physical surface tension and mass diffusion". (Invited) talk at Department of Mathematics, New Jersey's Science and Technology University, Newark, NJ, Jan. 2006.

4. "The influence of transport phenomena on turbulent mixing rates". (Invited) American Physical Society 58th Annual Meeting of the Division of Fluid Dynamics, Chicago, IL, Nov. 2005.

5. "A robust front tracking algorithm in three dimensions". (Poster) Harvey Mudd College Mathematics Conference on Scientific Computing, Claremont, CA, Nov. 2005.

6. "The influence of scale breaking phenomena on turbulent mixing rates". (Invited) Society for Industrial and Applied Mathematics Annual Meeting, New Orleans, LA, July 2005.

7. "Turbulent mixing with surface tension and physical diffusion". Midwest Numerical Analysis Conference, Iowa City, Iowa, May 2005.

8. "Turbulent mixing with surface tension". (Poster) Frontiers in Applied and Computational Mathematics, Newark, NJ, May 2005.