



**Dr. Jianming Liu**

副教授 计算数学硕士生导师 双博士

博士 南京航空航天大学 2010

博士 De Montfort University (UK) 2014

所在系部: 信息与计算科学系

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#### 个人工作与学习经历:

2018/9-2019/9, CSC国家公派访问学者访问 University of Texas at Arlington 数学系, 授予 University of Texas at Arlington 数学系杰出访问学者

2009/1-2014/12, Faculty of Technology, De Montfort University (DMU), 博士. Supervisors: Prof Mikhail Goman and Dr Xinkai Li; External examiner: Prof W. Malabsekera (Loughborough University, UK); Internal examiner: Prof B. Ulanick

2011.6-2013.6, 厦门大学数学科学学院数学博士后流动站博士后, 导师: 邱建贤教授

2010.7-2011.6, 江苏师范大学数学与统计学院讲师

2006.9-2010.7, 南京航空航天大学航空宇航学院流体力学专业博士, 导师: 赵宁教授

2004.5-2006.9, 江苏师范大学数学与统计学院教师

2001.9-2004.5, 东南大学数学系硕士, 导师: 孙志忠教授

#### 社会兼职

水动力学研究与进展杂志编委

Journal of Hydrodynamics (SCI JCR分区 Q3) 编委

#### 感兴趣研究领域:

偏微分方程数值解, 大规模科学与工程计算, 计算流体力学 (可压缩流体自适应笛卡尔网格算法, 间断有限元, 浸入边界方法, 分离涡模拟等) 及其在飞行器设计中应用

#### 其他兴趣爱好:

开源操作系统Linux, C/C++程序设计, Matlab编程, Python科学计算与多语言混合编程, Matlab及Python数据科学实践, 大规模并行计算MPI与OpenMP, GPU并行

#### 主持或参与项目:

9. 参与某十三五规划重大示范项目基础研究课题, 2019-2022, xx万, 在研。

8. 某横向项目 (2018-2019) ,xx万, 在研, 主持。
7. 某重大集成项目协作项目(2018-2019), xx万, 结题, 主持。
6. 国家自然科学基金面上项目, 61671223, 复杂电大电磁问题的高级时域有限差分方法及其在混合架构平台下四级并行技术研究, 2017/1-2020/12, 60万, 在研, 参加。
5. 国家自然科学基金重大研究计划, 91230110, 多介质流体的自适应高分辨算法研究, 2013/01-2015/12, 70万, 已结题, 参加。
4. 国家自然科学基金青年项目, 11102179, 粘性可压缩流体浸入边界方法研究, 2012/01-2014/12, 25万, 已结题, 主持。
3. 国家自然科学基金面上项目, 11171289, 大型稀疏代数方程组的高效算法及其在图像处理中的应用, 2012/01-2015/12, 46万, 已结题, 参加。
2. 国家自然科学基金青年项目, 11002071, 基于自适应非结构网格的虚拟单元浸入边界间断有限元方法研究, 2011/01-2013/12, 22万, 已结题, 参加。
1. 国家自然科学基金青年项目, 10901132, PageRank问题的研究及其在基因芯片数据挖掘中的应用, 2010/01-2012/12, 17万, 已结题, 参加。

#### 学生培养:

欢迎学生联系报考计算数学研究生, 通过三年系统学习, 学生有望在数值算法, 编程实践与计算流体力学等方面获得系统的训练, 学生培养将根据学生特点、兴趣爱及未来就业方向安排研究课题, 毕业学生有望从事科学与工程计算、大数据处理、软件开发等工作, 或在航空航天类大学继续深造, 为祖国的航空航天事业添砖加瓦。

#### 学术出版:

- [30] Jianming Liu, Xinkai Li, Xiuling Hu. A RBF-based differential quadrature method for solving two-dimensional variable-order time fractional advection-diffusion equation. *Journal of Computational Physics*, 384(2019), 222–238.
- [29] Jianming Liu, Yisheng Gao, Chaoqun Liu. An objective version of the Rortex vector for vortex identification. *Physics of Fluids*, 31(2019), 065112.
- [28] Jianming Liu, Chaoqun Liu. Modified normalized Rortex/vortex identification method. *Physics of Fluids*, 31(2019), 061704.
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- [25] Jian-ming Liu, Yue Deng, Yi-sheng Gao, Sita Charkrit, Chaoqun Liu. Mathematical foundation of turbulence generation—From symmetric to asymmetric. *Liutex. Journal of Hydrodynamics*, 2019, 31(3), 632–636.
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- [23] Yi-sheng Gao, Jian-ming Liu, Yifei Yu, Chaoqun Liu. A Liutex based definition and identification of vortex core center lines. *Journal of Hydrodynamics*, 2019, 31(3) 445–454.
- [22] Yi-qian Wang, Yi-sheng Gao, Jian-ming Liu, Chaoqun Liu. Explicit formula for the Liutex vector and physical meaning of vorticity based on the Liutex-Shear decomposition. *Journal of Hydrodynamics*, 2019, 31(3), 464–474.
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- [20] Wenqian Xu, Yisheng Gao, Yue Deng, Jianming Liu, and Chaoqun Liu. An explicit expression for the calculation of the Rortex vector. *Physics of Fluids*, online.
- [19] Yuxin Gan, Jianming Liu, Ning Zhao, Zhiwei Shen. A numerical study on a Cartesian-based body-fitted adaptive grid method[J]. *International Journal of Computational Fluid Dynamics*, 2018:1–17.
- [18] Jianming Liu, Jianxian Qiu, Mikhail Goman, Xinkai Li and Mellin Liu. Positivity-preserving Runge-Kutta discontinuous Galerkin method on adaptive Cartesian grid for strong moving shock. *Numerical Mathematics: Theory, Methods and Applications*, 2016, 9(1): 87–110.
- [17] Liu Jianming, Qiu Jianxian, Hu Ou, et al. Adaptive Runge-Kutta discontinuous Galerkin method for complex geometry problems on Cartesian grid. *International Journal for Numerical Methods in Fluids*, 2013, 73(10): 847–868.
- [16] Liu Jianming, Zhao Ning, Hu Ou, et al. A new immersed boundary method for compressible Navier-Stokes equations. *International Journal of Computational Fluid Dynamics*, 2013, 27(3): 151–163.
- [15] 赵宁, 胡偶, 刘剑明, 沈志伟. 可压缩流体自适应笛卡尔网格虚拟单元方法研究. 第十六届全国流体力学数值方法研讨会 2013 论文集, 北京, 2013
- [14] HU Ou, ZHAO Ning, LIU Jianming. A ghost cell method for turbulent compressible viscous flows on adaptive Cartesian grids. *Journal of Procedia Engineering*. Accepted.
- [13] 胡偶, 赵宁, 刘剑明. 壁面函数在激波诱导分离流动中的应用. 航空计算技术, 待发表.
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- [11] 胡偶, 赵宁, 刘剑明, 王东红. 基于有限体积分格式的自适应笛卡尔网格虚拟单元方法及其应用. *空气动力学学报*, 2011, 29(4): 491–495.
- [10] 刘剑明, 赵宁, 胡偶, 王东红. 自适应笛卡尔网格 Ghost Cell 方法研究. *空气动力学学报*, 2010, 28(1): 61–65.
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- [4] Wang Donghong, Zhao Ning, Liu Jianming, Shock Limiter in Front Tracking Method, *Chinese Journal of Computational Physics*, 2009, 26(4), 510–516 (in Chinese).
- [3] Liu Jianming, Finite difference method for reaction-diffusion equation with nonlinear and nonlocal boundary conditions, *Numer. Math. J. Chin. Univ.*, 2008, 30(4), 313–324 (in Chinese).
- [2] Jianming Liu, Zhizhong Sun, Finite difference method for reaction-diffusion equation with nonlocal boundary conditions. *Numer. Math. J. Chin. Univ. (Engl. Ser.)* 16(2007), No.2, 97–111.

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