

Zhiwu Lin

Contact Information

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Research Interests

Fluid dynamics, kinetic theory, nonlinear waves, stability theory

Education

- Peking University, Beijing, China
Mathematics, B.A. 1995
- Tokyo University, Tokyo, Japan
Mathematics, M.S. 1999
- Brown University, Providence, Rhode Island, USA
Mathematics, Ph. D. 2003

Appointment

- Courant Instructor, Courant Institute of New York University, 2003.9-2006.8
- Assistant professor, Department of Mathematics, University of Missouri-Columbia, 2006.8-2008.8
- Assistant professor, School of Mathematics, Georgia Institute of Technology, 2008.8-

Refereed Publications

1. Zhiwu Lin, *Instability of periodic BGK waves*, Math. Res. Letts., **8**, 521-534(2001).
2. Zhiwu Lin, *Stability and instability of traveling solitonic bubbles*, Adv. Differential Equations **7** (2002), no. 8, 897-918.
3. Zhiwu Lin, *Instability of some ideal plane flows*, SIAM J. Math. Anal., **35**, no. 2, 318-356 (2003).
4. Zhiwu Lin, *Some stability and instability criteria for ideal plane flows*, Comm. Math. Phys., **246**, no. 1, 87-112(2004).
5. Zhiwu Lin, *Nonlinear instability of ideal plane flows*, Int. Math. Res. Not., **41**, 2147-2178 (2004).
6. Zhiwu Lin, *Nonlinear instability of periodic waves for Vlasov-Poisson system*, Comm. Pure Appl. Math. **58**, 505-528 (2005).
7. Zhiwu Lin, *Some recent results on instability of ideal plane flows*, Nonlinear partial differential equations and related analysis, 217-229, Contemp. Math., **371**, Amer. Math. Soc., Providence, RI, 2005.

8. Zhiwu Lin and Walter Strauss, *Linear stability and instability of relativistic Vlasov-Maxwell systems*, Comm. Pure. Appl. Math. **60**, 724–787 (2007).
9. Zhiwu Lin and Walter Strauss, *Nonlinear stability and instability of relativistic Vlasov-Maxwell systems*, Comm. Pure. Appl. Math. **60**, 789–837 (2007).
10. Yan Guo and Zhiwu Lin, *Unstable and Stable Galaxy Models*, Comm. Math. Phys., **279**, 789-813 (2008).
11. Zhiwu Lin and Yue Liu, *Stability of peakons for the Degasperis-Procesi equation*, Comm. Pure. Appl. Math., **62**, 125-146 (2009).
12. Vera Hur and Zhiwu Lin, *Unstable surface waves in running water*, Comm. Math. Phys., **282**, 733-796 (2008).
13. Zhiwu Lin and Walter Strauss, *A sharp stability criterion for Vlasov-Maxwell systems*, Invent. Math., **173**, 497-546 (2008).
14. Zhiwu Lin *Instability of nonlinear dispersive solitary waves*, J. Func. Anal., **255** 1191-1224 (2008).
15. Zhiwu Lin, *Instability of large solitary water waves*, Inter. Math. Res. Not., 1247-1303, no 7., 2009.

Manuscripts

1. Y. Charles Li and Zhiwu Lin, *A Resolution of the Sommerfeld Paradox*, submitted, 2009.
2. Yueheng Lan, Y. Charles Li, Zhiwu Lin, *Sommerfeld paradox - A 2D study*, submitted, 2009.

Grant support

1. New York University Research Challenge Fund, 2005-2006.
2. Principal Investigator for NSF Grant DMS-0505460 (continued as DMS-0707397, DMS-0855903), 2005-2009.
3. Principal Investigator for NSF Grant DMS-0908175, 2009-1012.

Conference and seminar talks

- Brown PDE and applied math seminars (2002, 2003, 2004)
- Courant Analysis and MHD seminars (2003, 2004)
- Academia Sinica summer school (06/2004)
- Northwestern PDE meetings (Evanston, IL, 2003/5)
- AMS sectional meeting, Fluid stability session (Evanston, IL, 04/2004)
- Workshop on Stability of fluid and plasmas (Bayreuth, Germany, 09/2004)
- AMS sectional meeting, Nonlinear PDE session (Bowling Green, KY, 03/2005)
- Penn State PDE seminar (04/2005)

- Mittag-Leffler Institute, Institute seminar (10/2005)
- Colloquium and Seminars at: Oklahoma State University, UC Irvine, University of Michigan, University of British Columbia, University of North Carolina-Chapel Hill, University of South Carolina, North Carolina State University (01/2006)
- Colloquium and Seminars at: University of Missouri-Columbia, University of Massachusetts-Amherst, University of Maryland (02/2006)
- The Lefschetz Center Conference on Partial Differential Equations and Fluids, Brown University, (April 20-23, 2006)
- Applied mathematics seminar, University of Illinois, Chicago, (Oct 18, 2006)
- AMS sectional meeting, Progress on Problems in Mathematical Fluid Dynamics Session, Fayetteville, AR, (Nov 3-4, 2006)
- AMS sectional meeting, Session on Euler and Navier-Stokes equations, Chicago, IL, (Oct 5-6, 2007)
- PDE seminar, University of Minnesota, (11/07)
- PDE seminar, Georgia Institute of Technology, (02/08)
- 7th AIMS conference on dynamical system and differential equations, Arlington, VA, (05/08)
- joint meeting of American Mathematical Society(AMS) and Chinese Mathematical Society (CMS), Shanghai, China, (12/08).
- PDE seminar, Zhongshang University, Guangzhou, China, (01/09).
- Workshop on wave motion, Oberwolfach, Germany, 02/2009.
- The Sixth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, Georgia (03/09).
- ICMS conference on Analysis of Fluid Stability, Edinburgh, UK, 6/25/09-7/3/09.
- SIAM annual meeting, Session on Stability of solitary waves, Denver, Co, (July 6-10, 2009).
- Workshop on Kinetic Description of Multiscale Phenomena, U. Maryland, 9/21-9/25, 2009.
- AMS sectional meeting, Session on PDEs from Fluid Mechanics, Boca Raton, FL, 10/30 - 11/1, 2009.
- Workshop on Analysis and Computation of Incompressible Fluid Flow, IMA, U. Minnesota, 2/22-2/26, 2010.

Other Professional Activities

- Invited visitor at Mittag-Leffler Institute, Sweden, September and October 2005.
- Co-organizer of Session on Mathematical theory of water waves, SIAM Conference on Analysis of PDE, 12/7-12/10, 2009.
- Referee for numerous journals: Communications in Mathematical Physics, Contemporary Mathematics, Communications in Mathematical Sciences, Communications in Pure and Applied Mathematics, Mathematical Methods in the Applied Sciences, Computers & Mathematics with Applications, IMA J. Applied Math., Journal of Differential Equations, Journal of Dynamics and Differential Equations, Proceedings of AMS, Proceedings of the Royal Society A.

Courses Taught

- Calculus recitation sessions, Brown University (2000-2003)
- Calculus I, II and Linear algebra, New York University(2003-2006)
- Calculus for life sciences, Calculus III, Topic course on nonlinear PDE, Graduate PDE, University of Missouri-Columbia (2006-2008)
- Linear Algebra, Introduction to PDE, Georgia Institute of Technology, (2008-2010).