

# CURRICULUM VITAE

## 1 Personal Information

- Name: **Yihong DU**
- Gender: **Male.**
- Citizenship: **Australian**

## 2 Address

School of Science and Technology,  
University of New England,  
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## 3 Education

- 1978-1982: **Bachelor Degree Study**  
Department of Mathematics, Shandong University, China.  
Bachelor of Science awarded in 1982.
- 1982-1985: **Master Degree Study**  
Department of Mathematics, Shandong University.  
Master of Science awarded in 1985.
- 1985-1988: **Ph.D. Study**  
Department of Mathematics, Shandong University, China.  
Doctor of Science awarded in 1988.

## 4 Employment

- Aug., 1988– Sep., 1990: **Lecturer**  
Department of Mathematics, Shandong University, China.
- Sep., 1990-Aug., 1991: **Visiting Fellow**  
Dept of Maths, Heriot-Watt Univ., UK.
- Aug., 1991–Dec., 1992: **Research Fellow**  
Dept of Maths, University of New England, Australia.
- Jan., 1993–Dec., 1998: **Lecturer**  
Dept of Maths, University of New England.
- Jan., 1999–Dec. 2003: **Senior Lecturer**  
Dept of Maths, University of New England.

- Jan. 2004–Dec. 2007: **Associate Professor**  
Dept of Maths, University of New England.
- Jan. 2008–Present: **Professor**  
Dept of Maths, University of New England.
- Visiting Positions:
  - Jan.–Mar., 1996: Visiting Research Fellow  
School of Maths and Stats., Univ of Sydney.
  - May-June, 1996: The Royal Society Exchange Fellow  
Dept of Maths, Heriot-Watt Univ., UK.
  - Feb.-April, 2000: Visiting Fellow  
Dept of Applied Math., Complutense Univ. of Madrid, Spain.
  - Nov. 2002-Jan. 2003: Visiting Professor  
National Center for Theoretical Sciences, Taiwan.
  - April 2004–April 2010: Adjunct Professor  
Dept of Math., Qufu Normal Univ., China.
  - January 2006: Exchange Fellow of the Australian Academy of Science and JSPS (Japan)  
School of Math., Univ. of Tokyo, and Dept of Math., Waseda Univ., Japan.
  - March-April, 2007: Visiting Professor  
National Center for Theoretical Sciences, Taiwan.
  - Oct-Nov, 2012: Long-term Visitor  
Institute for Mathematics and Its Applications, Univ. of Minnesota.

## 5 Professional Activities

### Editorial Board and Committees:

- Member of Editorial Board, “Discrete and Continuous Dynamical Systems-Series S”, 2008-2013.
- Associate Editor, “Journal of Mathematical Analysis and Applications”, From 2013.
- Chair of Research Committee, School of Science and Technology, Univ. of New England, 2008-2009.
- Member of Scientific Committee, the 2nd international conference on reaction-diffusion systems and viscosity solutions, July 13-18, 2009, Taichung, Taiwan.
- Member of Scientific Committee, the 55th annual meeting of the Australian Mathematical Society, Sept, 2011, Wollongong, Australia.
- Member of Scientific Committee, international conference on recent development of non-linear PDEs, Nov., 2013, Australian National Univ., Canberra.

### Referee:

Served as referee for more than 20 international research journals including:

*Archive for Rational Mechanics and Analysis*  
*Journal of Functional Analysis*

*Journal of Differential Equations*  
*Proceedings of the London Mathematical Society*  
*SIAM Journal on Mathematical Analysis*  
*Transactions of the American Mathematical Society*

**Conference Organization:**

- (With M.C. Hong and C. Radford) Nonlinear Partial Differential Equations and Their Applications, 8-12 December, 2003, Univ. of New England, Armidale, Australia.
- Workshop on Nonlinear Analysis and Partial Differential Equations, 25-30 Dec. 2004, Qufu Normal Univ. (Qufu Campus), China.
- (With L. Liu and Z. Liu) International Conference on Nonlinear Partial Differential Equations, 11-16 July, 2005, Qufu Normal Univ. (Rizhao Campus), China.
- (With D. Daners, C. Radford and S. Yan) Recent Advances in Nonlinear Partial Differential Equations: A celebration of Norman Dancer's 60th birthday, 16-21 July, 2006, University of New England (Armidale), Australia.
- (With E.N. Dancer, C. Mischaikow, P. Polacik and X.Q. Zhao) Recent Progress on Nonlinear Elliptic and Parabolic Problems and Related Abstract Methods 7-12 October, 2007, Banff International Research Station, Canada.
- (With Daniel Daners and Tom ter Elst) The 7th Australia-New Zealand Mathematics Convention, special session on PDE, December 8-12, 2008, Christchurch, New Zealand.
- (With James McCoy) The 54th Australian Mathematical Society Annual Meeting, special session on Calculus of Variations and PDE, Sept. 27-30, 2010, Brisbane, Australia.
- (With Ben Andrews) The 55th Australian Mathematical Society Annual Meeting, special session on Calculus of Variations and PDEs, Sept. 26-29, 2011, Wollongong, Australia.
- (Co-chair of organizing committee) International Conference on Variational Methods and Nonlinear Partial Differential Equations, April 16-19, 2012, Academy of Mathematics and Systems Science, the Chinese Academy of Sciences, Beijing.
- (Chair of organizing committee) International conference on recent development of nonlinear PDEs, Nov. 25-29, 2013, Australian National Univ., Canberra.

## 6 Major recent research grants

- Y. Du and E.N. Dancer, Free Boundary Problems in Partial Differential Equations and Related Topics, Australian Research Council (ARC) discovery grant, 2003-2006, \$158,000.
- Y. Du, E.N. Dancer and S. Yan, Sharp Transitions in Partial Differential Equations and Related Problems, ARC discovery grant, 2007-2009, \$240,000.
- Y. Du, E.N. Dancer and S. Yan, Transitions and singular behavior in nonlinear partial differential equations, ARC discovery grant, 2010-2012, \$306,000.
- Y. Du, Propagation and free boundary problems in nonlinear partial differential equations, ARC discovery grant, 2012-2014, \$255,000.
- S. Yan, E.N. Dancer and Y. Du, Singularity, degeneracy and related problems in nonlinear partial differential equations, ARC discovery grant, 2013-2015, \$300,000.

## 7 Publications

Over 100 publications with a total of 1469 citations by 496 different authors according to Math-SciNet (Jan. 2014). Publications from 2006 are listed below.

### Books:

1. Y. Du, Order Structure and Topological Methods in Nonlinear Partial Differential Equations, Vol. 1, Maximum Principles and Applications, *World Scientific*, 2006.
2. Y. Du, Hitoshi Ishii and Wei-Yueh Lin (eds.) Recent Progress in Nonlinear Partial Differential Equations and Viscosity Solutions, World Scientific Publishing, 2009.

### Book chapters:

3. Y. Du and Junping Shi, Some recent results on diffusive predator-prey models in spatially heterogeneous environment, in Nonlinear Dynamics and Evolution Equations, Eds. Hermann Brunner, Xiao-Qiang Zhao and Xingfu Zou, Fields Institute Communications Vol. 48, American Math. Soc., 2006, pp 95-135.
4. Y. Du, Change of environment in model ecosystems: effect of a protection zone in diffusive population models, in "Recent Progress in Nonlinear Partial Differential Equations and Viscosity Solutions", Eds. Y. Du, H. Ishii and W.Y. Lin, World Scientific Publishing, 2009, pp 49-73.

### Journal Articles:

5. Y. Du and Z.M. Guo, Boundary layer and spike layer solutions for a bistable elliptic problem with generalized boundary conditions, *J. Diff. Eqns.*, 221(2006), 102-133.
6. Y. Du and J. Shi, A diffusive predator-prey model with a protection zone, *J. Diff. Eqns.*, 229(2006), 63-91.
7. Y. Du and M.X. Wang, Asymptotic behavior of positive steady-states to a predator-prey model, *Proc. Roy. Soc. Edinburgh*, 136A(2006), 759-778.
8. Y. Du and Z-M. Guo, The degenerate logistic model and a singularly mixed boundary blow-up problem, *Discrete and Continuous Dynamical Systems*, 14(2006), 1-29.
9. E.N. Dancer and Y. Du, A uniqueness theorem for a free boundary problem, *Proc. Amer. Math. Soc.*, 134(2006), 3223-3230.
10. Y. Du and J. Shi, Allee effect and bistability in a spatially heterogeneous predator-prey model, *Trans. Amer. Math. Soc.*, 359(2007), 4557-4593.
11. Y. Du and K. Nakashima, Morse index of layered solutions to the heterogeneous Allen-Cahn equation, *J. Diff. Eqns.*, 238(2007), 87-117.
12. F. Cirstea and Y. Du, Asymptotic behavior of solutions of semilinear elliptic equations near an isolated singularity, *J. Functional Anal.*, 250(2007), 317-346.
13. Y. Du, The heterogeneous Allen-Cahn equation in a ball: solutions with layers and spikes, *J. Diff. Eqns.*, 244(2008), 117-169.

14. Y. Du and Xing Liang, A diffusive competition model with a protection zone, *J. Diff. Eqns.*, 244(2008), 61-86.
15. Y. Du and S.-B. Hsu, Concentration phenomena in a nonlocal quasilinear problem modelling phytoplankton I: Existence, *SIAM J. Math. Anal.* 40(2008), 1419-1440.
16. Y. Du and S.-B. Hsu, Concentration phenomena in a nonlocal quasilinear problem modelling phytoplankton II: Limiting profile, *SIAM J. Math. Anal.* 40(2008), 1441-1470.
17. Y. Du, P.Y.H. Pang and M. Wang, Qualitative analysis of a predator-prey model with stage structure for the predator, *SIAM J. Appl. Math.*, 69(2008), 596-620.
18. Y. Du, Rui Peng and Mingxin Wang, Effect of a protection zone in the diffusive Leslie predator-prey model, *J. Diff. Eqns.*, 246(2009), 3932-3956.
19. Y. Du and Z.M. Guo, Positive solutions of an elliptic equation with negative exponent: stability and critical power, *J. Diff. Eqns.*, 246(2009), 2387-2414.
20. Y. Du and Yoshio Yamada, On the long-time limit of positive solutions to the degenerate logistic equation, *Discrete and Continuous Dynamical Systems A*, 25(2009), 123-132.
21. F. Cirstea and Y. Du, Isolated singularities for weighted quasilinear elliptic equations, *J. Functional Anal.*, 259(2010), 174-202.
22. Y. Du and Zhigui Lin, Spreading-vanishing dichotomy in the diffusive logistic model with a free boundary, *SIAM J. Math. Anal.*, 42(2010), 377-405.
23. Y. Du and S.B. Hsu, On a nonlocal reaction-diffusion problem arising from the modeling of phytoplankton growth, *SIAM J. Math. Anal.*, 42(2010), 1305-1333.
24. Y. Du and Hiroshi Matano, Convergence and sharp thresholds for propagation in nonlinear diffusion problems, *J. European Math. Soc.*, 12(2010), 279-312.
25. Y. Du and Linfeng Mei, On a nonlocal reaction-diffusion-advection equation modeling phytoplankton, *Nonlinearity*, 24(2011), 319-349.
26. Y. Du and Zongming Guo, Spreading-vanishing dichotomy in the diffusive logistic model with a free boundary II, *J. Diff. Eqns.*, 250(2011), 4336-4366.
27. E.N. Dancer, Y. Du and Zongming Guo, Finite Morse index solutions of an elliptic equation with supercritical exponent, *J. Diff. Eqns.*, 250(2011), 3281-3310.
28. Y. Du and Li Ma, A Liouville theorem for conformal Gaussian curvature type equations in  $R^2$ , *Calculus of Variations and PDEs*, 43(2012), 485-505.
29. Y. Du and Z.M. Guo, The Stefan problem for the Fisher-KPP equation, *J. Diff. Eqns.*, 253(2012), 996-1035
30. Y. Du and R. Peng, The periodic logistic equation with spatial and temporal degeneracies, *Trans. Amer. Math. Soc.*, 364(2012), 6039-6070.
31. Y. Du and R. Peng, Sharp spatiotemporal patterns in the diffusive time-periodic logistic equation, *J. Diff. Eqns.*, 254 (2013), 3794-3816.
32. Y. Du and Z.M. Guo, Finite Morse index solutions and asymptotics of weighted nonlinear elliptic equations, *Adv. Diff. Eqns.*, 18(2013), 737-768.

33. E.N. Dancer, Y. Du and M. Efendiev, Quasilinear elliptic equations on half- and quarter-spaces, *Adv. Nonlinear Studies* (special issue dedicated to Klaus Schmitt), 13 (2013), 115-136.
34. Y. Du, Zongming Guo and Rui Peng, A diffusive logistic model with a free boundary in time-periodic environment, *J. Funct. Anal.*, 265 (2013), 2089-2142.

## 8 Honors and Awards

- Exemption of entrance exam to Shandong Univ., 1978.
- First Prize for Best Undergraduate Research Article, Shandong Univ., 1981.
- Sino-British Friendship Scholarship, 1990-91.
- Australian Academy of Science and the Royal Society Exchange Fellow, 1996.
- Australian Academy of Science and Academia Sinica Exchange Fellow, 1999, 2002.
- Australian Academy of Science and JSPS (Japan) Exchange Fellow, 2006.
- Vice-Chancellor's Award for Excellence in Research, Univ. of New England, 2007.
- Member of Australian Research Council's College of Experts, from 2013.