Curriculum Vitae of

Michael M. H. Pang
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Education

B.Sc., Mathematics, Imperial College, London University, 1983
Ph.D., Mathematics, King's College, London University, 1988

Positions Held

Teaching Assistant, Purdue University, Sept. 1983-Dec. 1984
Research Associate, King's College, London University, Oct. 1987-Dec. 1991
Visiting Assistant Professor, University of California, Riverside, Apr. 1992-Jun. 1993
Visiting Assistant Professor, Cornell University, Sept. 1993-Jun. 1994
Assistant Professor, University of Missouri, Columbia, Sept. 1994-Aug. 1998
Associate Professor, University of Missouri, Columbia, Sept. 1998-Dec. 1999
Visiting Associate Professor, Purdue University, Indiana, Jan. 2000-June 2000
Associate Professor, University of Missouri, Columbia, Aug. 2000-May 2009
Professor, University of Missouri, Columbia, June 2009- present

Research Publications

1. (with E. B. Davies) *The Cauchy problem and a generalization of the Hille-Yosida theorem*, Proc. London Math. Soc., **55** (1987), 181-208.

2. *L^1 properties of two classes of singular second order elliptic operators*, J. London Math. Soc., **38** (1988), 525-543.

3. (with E. B. Davies) *Sharp heat kernel bounds for some Laplace operators*, Quart. J. Math (Oxford), **40** (1989), 281-290.

4. (with E. B. Davies) *The eigenvalue gap for second order elliptic operators with Dirichlet boundary conditions*, J. Diff. Equations, **88** (1990), 47-70.

5. *Resolvent estimates for Schrödinger operators in $L^p(\mathbb{R}^n)$ and the theory of exponentially bounded C-semigroups*, Semigroup Forum, **41** (1990), 97-114.

6. *Heat kernels of graphs*, J. London Math. Soc., **47** (1993), 50-64.

7. (with M. L. Lapidus) *Eigenfunctions of the Koch snowflake domain*, Comm. Math. Phys., **172** (1995), 359-376.

8. *Approximation of ground state eigenfunction on the snowflake region*, Bull. London Math. Soc., **28** (1996), 488-494.

9. *L^1 and L^2 properties of a class of singular second order elliptic operators on $\mathbb{R}^N$ with measurable coefficients*, J. Diff. Equations, **129** (1996), 1-17.

10. *Approximation of ground state eigenvalues and eigenfunctions of Dirichlet Laplacians*, Bull. London Math. Soc., **29** (1997), 720-730.

11. (with A. J. Lindeman, Z. Zhao) *Sharp bounds for ground state eigenfunctions on domains with horns and cusps*, J. Math. Anal. Appl., **212** (1997), 381-416.

12. (with R. Bañuelos) *Lower bound gradient estimates for solutions of Schrodinger equations and heat kernels*, Comm. Part. Diff. Eqns., **24** (1999), 499-543.

13. (with H. Trivedi, A. Campell, P. Saab) *Slowing the progression of chronic renal failure: Economic aspects and patients' perspectives*, Amer. J. of Kidney Diseases, **39** (2002), 721-729 and Appendix 1-13.

14. (with H. Trivedi) *Discrepancy in the epidemiology of non-diabetic chronic renal insufficiency and end-stage renal disease in black and white Americans: The Third National Health and Nutrition Examination Survey (NHANES III) and United States Renal Data System (USRDS)*, J. of Nephrology, **23** (2003), 448-457.

15. (with R. Bañuelos) *An inequality for potentials and the hot-spots conjecture*, Indiana Univ. Math J., **53** (2004), 35-48.

16. (with R. Bañuelos and M. Pascu) *Brownian motion with killing and reflection and the hot-spots problem*, Prob. Theory and Related Fields **130** (2004), 56 - 68.

17. (with R. Bañuelos) *Level sets of Neumann eigenfunctions*, Indiana Univ. Math. J., **55** (2006), 923 - 939.

18. *Some remarks on essential self-adjointness and ultracontractivity of a class of singular elliptic operators*, Math. Nachr., Vol 281(2008), no. 8, 1069-1078.

19. *Stability and approximations of eigenvalues and eigenfunctions for the Neumann Laplacian, Part 2*, J. Math. Anal. Appl., J. Math. Anal. Appl. Vol. 345 (2008), no. 1, 485-499.

20. *The heat kernel of the Laplacian defined on a uniform grid*, Semigroup Forum, Vol 78(2008), 238-252.

21. (with R. Bañuelos) *Stability and approximations of eigenvalues and eigenfunctions of the Neumann Laplacian, Part 1*, Elect. J. Diff. Equations, Vol. 2008(2008), no. 145, 1-13.

22. *Stability and approximations of eigenvalues and eigenfunctions for the Neumann Laplacian, Part 3*, Elect. J. Diff. Equations, Vol. 2011(2011), no. 100, 1-54.

Submitted Preprint

1. "On an upper heat kernel bound of Davies and Pang".

2. "Sharp bounds for domain perturbations of Dirichlet Laplacians defined on smooth domains".

Invited Talks

1. "Eigenvalue gap of second order elliptic operators with measurable coefficients", Analysis Seminar, Heriot-Watt University, Britain, 1989.

2. "L^1 properties of second order singular elliptic operators", Functional Analysis Seminar, Oxford University , Britain, 1990.

3. "L^1 properties of second order singular elliptic operators", Analysis Seminar, University of London, Goldsmith College, Britain, 1991.

4. "L^1 properties of second order singular elliptic operators", Partial Differential Equations Seminar, University of Cardiff, Britain, 1991.

5. "Heat kernels on graphs", Partial Differential Equations Seminar, University of Sussex, Britain, 1991.

6. "L^1 properties of second order singular elliptic operators", Analysis Seminar, University of Nottingham, Britain, 1991.

7. "Exponentially bounded C-semigroups and Schrödinger operators in $L^p(\mathbb{R}^N)$", Functional Analysis Seminar, University of Southern California, California, 1992.

8. "Heat kernels on graphs", Conference on Semigroups and Evolution Equations, Louisiana State University, Louisiana, 1992.

9. "L^1 properties of second order singular elliptic operators", Geometry Seminar, University of California-Irvine, California, 1993.

10. "L^1 properties of second order singular elliptic operators", Colloquium, Ohio University, Athens, Ohio, 1993.

11. "L^1 properties of second order singular elliptic operators", Colloquium, University of Alabama in Birmingham, Alabama, 1993.

12. "Eigenfunctions on Koch snowflake", Special Session on Harmonic Analysis, AMS Meeting, Syracuse University, New York, 1993.

13. "Eigenfunctions on Koch snowflake", Colloquium, University of Wyoming, Wyoming, 1994.

14. "Eigenfunctions on Koch snowflake", Conference on Evolution Equations, Louisiana State University, Louisiana, 1994.

15. "Eigenfunctions on Koch snowflake", Conference on Wavelets and Fractals, University of Pittsburgh, Pennsylvania, 1994.

16. "Eigenfunctions on Koch snowflake", Colloquium, University of Missouri-Columbia, Missouri, 1994.

17. "L^1 properties of second order singular elliptic operatrs", Partial Differential Equations Seminar, Purdue University, Indiana, 1994.

18. "Eigenfunctions of domains with outward pointing cusps", Workshop on applied Analysis, Technical University of Clausthal, Germany, 1995.

19. "Ground state eigenfunctions of snowflake domains", Conference on Partial Differential Equations, Caputh, Germany, 1995.

20. "Sharp bounds for ground state eigenfunctions on domains with horns and cusps", Special Session on Analysis on Fractals, AMS Meeting, San Diego, California, 1997.

21. "Lower bound gradient estimates for eigenfunctions and heat kernels", Special Session on Partial Differential Equations, AMS Meeting, University of Memphis, Tennessee, 1997.

22. "Lower gradient bound for Schrödinger equations", Special Session on Elliptic Partial Differential Equations, International Conference on Differential Equations and Mathematical Physics, Birmingham, Alabama, 1999.

23. "Lower gradient bound for Schrödinger equations", Partial Differential Equations Seminar, Purdue University, Indiana, 2000.

24. "An Alternative Proof of Pascu's Theorem on Hot-Spots Conjecture", International Conference on Diff. Eqns. and Math. Phys., Birmingham, Alabama, 2002.

25. "Stability of Neumann eigenvalues and eigenfunctions of the Koch snowflake", Kansas-Missouri Winter School of Applied Probability, University of Missouri-Columbia, Missouri, 2008.

26. "Stability of Neumann eigenvalues and eigenfunctions of the Koch snowflake", Colloquium, University of Missouri-Rolla, Missouri, 2008.

27. "An elementary probabilistic proof of Pascu's theorem on the hot spots conjecture", Probability and Statistics Seminar, Lawrence, University of Kansas, 2008.

Departmental Seminars in Home Universities

1. "Exponentially bounded C-semigroups", Functional Analysis Seminar, University of London, King's College, Britain, 1987.

2. "C-semigroups and Schrödinger operators in $L^p(\mathbb{R}^N)$", Functional Analysis Seminar, University of London, King's College, Britain, 1991.

3. "C-semigroups and Schrödinger operators in $L^p(\mathbb{R}^N)$", Partial Differential Equations Seminar, University of California-Riverside, California, 1992.

4. "Heat kernels on graphs", Partial Differential Equations Seminar, University of California, Riverside, California, 1993.

5. "Eigenfunctions on domains with fractal boundary", Analysis Seminar, Cornell University, New York, 1993.

6. "Eigenfunctions on Koch snowflake", Olivetti Club Seminar, Cornell University, New York, 1994.

7. "Eigenfunctions on domains with outward pointing cusps", Partial Differential Equations Seminar, University of Missouri-Columbia, Missouri, 1995.

8. "L^1 properties of singular second order elliptic operators", Partial Differential Equations Seminar, University of Missouri-Columbia, Missouri, 1996.

9. "Stability and approximation of Neumann eigenvalues and eigenfunctions", Differential Equations Seminar, University of Missouri-Columbia, Missouri, 2007.

10. "Upper heat kernel bound for the Laplacian defined on a uniform grid", Differential Equations Seminar, University of Missouri-Columbia, 2009.

11. "Sharp bounds for domain perturbations of Dirichlet Laplacians defined on smooth domains", Differential Equations Seminar, University of Missouri-Columbia, 2014.

Conferences Attended since 1992

1. Conference on Semigroups and Evolutions Equations, Louisiana State University, Louisiana, 1992.

2. AMS Meeting, Cincinnati, Ohio, 1993.

3. AMS Meeting, Syracuse University, New York, 1993.

4. Conference on Evolution Equations, Louisiana State University, Louisiana, 1994.

5. Conference on Wavelets and Fractals, University of Pittsburgh, Pennsylvania, 1994.

6. Conference on Partial Differential Equations, University of Tennessee-Knoxville, Tennessee, 1994.

7. Workshop on Applied Analysis, Technical University of Clausthal, Germany, 1995.
8. Conference on Partial Differential Equations, Caputh, Germany, 1995.
9. AMS Meeting, San Diego, California, 1997.
10. AMS Meeting, University of Memphis, Tennessee, 1997.
11. International Conference on Differential Equations and Mathematical Physics, Birmingham, Alabama, 1999.
12. Conference on Differential Equations, Purdue University, Indiana, 2000.
13. International Conference on Differential Equations and Mathematical Physics, Birmingham, Alabama, 2002.
14. Kansas-Missouri Winter School of Applied Probability, University of Missouri-Columbia, Missouri, 2008.

Courses Taught since January 2010

Math 1700 Calculus II
Math 4100 Differential Equations

Service and Administration

- Member of Graduate Recruitment Committee, FS2001-WS2002.
- Member of the Curriculum Committee, FS2000-WS2001, FS 2003- SS 2005 (Chair of the Curriculum Committee), FS2007-present .
- Coordinator of Math 304 (currently Math 4100), WS2003-WS2004 and FS 2008- FS 2010.
- Director of Undergraduate Studies of Mathematics Department, WS2002-SS2005.
- Member of WWW Committee, FS2006-WS2008.