

CURRICULUM VITAE: JILL PIPHER

Education

B.A. in Mathematics, UCLA, 1979

PhD. in Mathematics, UCLA, 1985, Analysis

Professional Experience

1985 - 1987, L. E. Dickson Instructor, University of Chicago

1987 - 1990, Assistant Professor, University of Chicago

1989 - 1994, Associate Professor, Brown University

1994 - present, Professor, Brown University

Research and Publications

Bounded double square functions, *Ann. Inst. Fourier* 2, (1986), p. 69-82.

Journe's covering lemma and its extension to higher dimensions, *Duke J. Math.* 53 (3) (1986), p. 683-690

Hardy spaces and the Dirichlet problem on Lipschitz domains, with C. Kenig, *Revista Iberoamericana* 3 (2) (1987), p. 191-247

Oblique derivative problems on Lipschitz domains with L^p data, with C. Kenig, *Amer. J. Math.* 110 (4) (1988), p. 715-738

Oblique derivative problems for the Laplacian in Lipschitz domains, *Revista Iberoamericana* 3 (3) (1988), p.455-471

The h-path distribution of the lifetime of conditioned Brownian motion for non-smooth domains, with C. Kenig, *Probab. Th. Rel. Fields* 82 (1989), p. 615-623

Area integral estimates for biharmonic functions, with G. Verchota, *TAMS* 327 (2) (1991), p. 903-918

The theory of weights and the Dirichlet problem for elliptic equations, with R. Fefferman and C. Kenig, *Annals of Math.* 134 (1991)p. 65-124

Partial Differential Equations with Minimal smoothness and Applications, IMA Vol 42, Springer-Verlag, 1992, Co-editor

The Dirichlet problem in L^p for biharmonic functions on Lipschitz domains, with G. Verchota, *Amer. J. Math.* 114 (1992), p. 923-972

The maximum principle for biharmonic functions, with G. Verchota, *Comm. Math. Helv.* 68 (1993), p. 385-414

A martingale inequality related to exponential square integrability, *PAMS* 118 (2) (1993)

Maximum principles for polyharmonic functions in Lipschitz and C^1 domains, with G. Verchota, *J. Potential Analysis* 4 (1995), p. 615-636

The Neumann problem for elliptic equations with non-smooth coefficients, with C. Kenig, *Inventiones Math.* 113 (1995), p.447-509

Boundary value problems for higher order operators, *Fourier Analysis and Partial Differential Equations: Proceedings of the El Escorial Conference*, edited by J. Garcia-Cuerva et al, Chapter 20 (1995), CRC Press.

Dilation invariant estimates and a boundary Garding inequality, with G. Verchota, *Annals of Math.* 14 (1995), p. 1-38

The Neumann and regularity problem for second order divergence form equations, Part II, with C. Kenig, *Duke J. Math.* 81 (1) Special volume in honor of J. Nash (1995), p. 227-250

Review of: *Harmonic Analysis Techniques in Second Order Elliptic PDE*, by Carlos Kenig, *Bulletin of the AMS* 33 (2) (1996), p. 229-236

Area integral estimates for higher order elliptic equations and systems, with B. Dahlberg, C. Kenig and G. Verchota, *Annals L'Inst. Fourier* 47 (1997), p.1425-1461

A convexity property of eigenvalues and applications, with W. Beckner and C. Kenig, preprint

Littlewood-Paley estimates: some applications to elliptic boundary value problems, *CRM Proceedings and Lecture Notes* 12 (1997), p. 221-238.

Vector potential theory on non-smooth domains in $\mathbf{R}^3$, and applications to electromagnetic scattering with D. Mitrea and M. Mitrea, *J. Fourier Analysis and Appl.* 3 (2) (1997), p. 131-192

Multiparameter operators and sharp weighted inequalities, with R. Fefferman, *American J. Math.* 119 (2) (1997), p. 337-370

The inhomogeneous Dirichlet problem for Δ^2 in Lipschitz domains, with V. Adolfsson, *J. Funct. Anal.* 159 (1998), p. 137-190

The absolute continuity of elliptic measure revisited, with C. Kenig, *J. of Fourier Analysis and Applications* (4) (1998), p. 463-468

NTRU: a ring based public key cryptosystem, with J. Hoffstein and J. Silverman, *Algorithmic Number Theory (ANTS III)*, J. Buhler (ed.), *Lecture Notes in Computer Science* 1423, Springer-Verlag (1998), p. 267-288

A new approach to the absolute continuity of elliptic measure, with applications to non-symmetric equations, with H. Koch, C. Kenig and T. Toro, *Advances in Math.* 153 (2000), p.231-298.

NSS: An NTRU lattice-based signature scheme, with J. Hoffstein and J. Silverman, *Proceedings of Eurocrypt 2001*.

The Dirichlet problem for elliptic equations with drift terms, with C. Kenig, *Publicaciones Matematicas* 45 (2001), 199-217.

Five lectures on NTRU encryption and digital signatures, *L'Institut Fourier, Grenoble, 2002 Summer School in Cryptology*

NTRUSign: Digital Signatures using the NTRU lattice, with N. Howgrave-Graham, J. Hoffstein, J. Silverman, W. Whyte, *CT-RSA 2003 Proceedings*.

Biparameter paraproducts, with C. Muscalu, T. Thiele, T. Tao, *Acta Mathematica* 193 (2004), p. 269-296.

Multiparameter paraproducts, with C. Muscalu, T. Thiele, T. Tao, to appear *Revista Math. Ibero.*

A covering lemma for rectangles in $\mathbb{R}^n$, with R. Fefferman, *Proc. AMS* 133, No.11 (2005), p.3235-3241.

Variations on the theme of Journé's lemma, with C. Cabrillo, M. Lacey, and U. Molter, to appear *Houston J. Math.*

On estimating the lattice security of NTRU, with N. Howgrave-Graham and J. Hoffstein, submitted

BMO from Dyadic BMO, with L. Ward, preprint on website.

Square functions and boundary value problems, with M. Dindos and S. Petermichl, in preparation.

Selected Invited Lectures, 2000-present

Invited Speaker, El Escorial Conference in Harmonic Analysis, Spain, 2000.

Invited Speaker, Conference in Harmonic Analysis and PDE in memory of Bjorn Dahlberg, Chalmers University, Goteborg, Sweden, June 2001

Invited Speaker, Conference in Harmonic Analysis, NSF and AMS sponsored, Mt. Holyoke MA, June 2001

Faculty Forum, Inauguration of Ruth Simmons, Brown, October 2001

Invited Speaker, Conference in Complex and Harmonic Analysis, Los Angeles, CA, December 2001.

Invited Speaker, Grenoble Summer School in Cryptology: 5 lectures on NTRU encryption and digital signatures, June 2002

Berkeley, November 2003

Main speaker at NSF supported 6th annual New Mexico Analysis Conference, lectures in elliptic pde, March 2003

Invited speaker, joint AMS-RSME meeting, Seville, Spain, June 2003

Invited Speaker, Fabes-Chiarenza International Conference, Siracusa, Italy, December 2003.

Invited Speaker, Fabes-Riviere International Conference, Minneapolis, Minnesota, April 2004

Invited Lecturer, Women's Program at IAS : 5 lectures on analysis for the graduate course, one research lecture, May 2004.

UCLA Analysis Seminar, November 2004

University of North Carolina, Colloquium and Special Seminar, 2005

Invited Speaker, Conference in Honor of A.Baernstein, Washington University, St. Louis, May 2005

University of Edinburgh, The Maxwell Institute Analysis Seminar, October 2005.

Research in Progress

The boundary behavior of solutions to elliptic equations, with Martin Dindos and Stefanie Petermichl

Multiparameter commutators, with M. Lacey, Stefanie Petermichl and Brett Wick.

Undergraduate text in mathematical cryptography, with J. Hoffstein and J. Silverman

University Service, since 2000

(i) University

Freshman advising, 2002, 2003, 2005.

WISE faculty advisor/mentor, 2000-present

Nominations Committee, 2000-01.

Inaugural Committee - Faculty forums, Inaugural Weekend, spring 2001

Provost Search Committee, fall 2001.

Sophomore advising, 2003.

Academic Priorities Committee member, fall 2003, spring 2004.

Dean of the College Search Committee member, Spring 2006.

(ii) Recent Professional Activities

NSF Panel Member, Reviewer of Individual and Group Grants.

Co-organizer, International Conference in Analysis and PDE in honor of Carlos Kenig, Chicago, IL, September 17-19 2004.

Member, AMS, AWM

AMS Eastern Division Plenary Speaker Committee Member, 2004 - present.

Co-organizer, Brown Analysis Seminar, 2000-present

Co-organizer, Conference in Analysis in honor J. B. Garnett, December 2001.

Invited participant, Park City Summer Program in Analysis, 2003.

Invited participant, IPAM semester in Multidimensional Analysis, November 2004.

Research in Teams, Banff, March 2006.

(iii) Department

Senior search committee, 2000, 2002, 2003 - present.

Tamarkin search committee, 2001, 2004.

Member, Department systems administrator hiring committee, 2000

Mathematics/Applied Mathematics WISE affinity group activities and weekly meetings, 2000-present.

Chair of Departmental Curriculum Review Committee, 2001

Executive Officer, Fall 2003 - 2004.

Reading member of thesis committee: Kathryn Leonard (2003), Rafe Johnson (2005), Brett Wick (2005), Minh Ha Quang (2004-06), Vera Hur (2006).

Department Chair, January 2005 - present

Awards and Honors

NSF Postdoctoral Fellowship, 1987-90

Sloan Fellowship, 1989-93

Presidential Young Investigator Award, 1990-95

Mathematical Sciences Research Inst. Research Professor, 1997

NSF research grants. 2006-2009.

Teaching

Graduate Courses: Real Variables, PDE, Complex Variables, Probability

Undergraduate Courses: Real Analysis, Probability, Cryptography, Functional Analysis, PDE, ODE

PhD Students: Nancy Lim, Sanja Hukovic, Danielle Jamison, Camil Muscalu.

Independent Study courses: spring 2000, fall 2000, fall 2001, spring 2002, fall 2003, summer 2003, summer 2004.

Undergraduate Honors Thesis supervision, three between 2000-2004.