

# PEDRO J. MÉNDEZ

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## EDUCATION

Ph.D. in Mathematics	Purdue University	May 2001
B.S. in Mathematics	Universidad de Costa Rica	December 1993

## THESIS

*Sharp Estimates for Dirichlet Heat Kernels of the Laplacian, Fractional Laplacian and Applications to Probability*

Thesis Advisor: Rodrigo Bañuelos

Areas of research: Probability and its applications to Spectral Theory and Potential Theory

## PROFESSIONAL EXPERIENCE

Invited Professor	Universidad de Costa Rica	August 2004-July 2005
Wylie Assistant Professor	University of Utah	August 2001-June 2004
Graduate Teaching Assistant	Purdue University	August 1996- May 2001
Instructor	Universidad de Costa Rica	February 1995- July 1996
Teaching Assistant	Universidad de Costa Rica	1990-1994

## AWARDS

Prize TWAS-CONICIT 2005	Third World Academy of Science	April 2005
Wylie Assistant Professor	University of Utah	August 2001-June 2004
CMI Liftoff Mathematician	Clay Mathematics Institute	May-August 2001
NSF Research Assistant	Purdue University	January-August 1998 August-December 2000
Purdue Research Foundation Fellowship	Purdue University	Fall 1998- Summer 2000

## LIST OF PUBLICATIONS

- 1) Toward a Geometrical Characterization of Intrinsic Ultracontractivity of the Dirichlet Laplacians, *Michigan Math. J.* 47 (2000), 79-99.
- 2) (with R. Bañuelos), Sharp Inequalities for Ratios of Heat Kernels of Schrödinger Operators and Applications to Spectral Gaps, *Jour. Funct. Anal.* 176 (2000), 368-399.
- 3) (with R. Bañuelos and R. Latała), A Brascamp-Lieb-Luttinger Type Inequality and Applications to Symmetric Stable Processes, *Proc. Amer. Math. Soc.* 129 (2001), 2997-3008.
- 4) Brascamp-Lieb-Luttinger Inequalities for Convex Domains of Finite Inradius, *Duke Math. J.* 113 (2002), 93-131.
- 5) Exit Times from Cones in  $R^n$  of Symmetric Stable Processes, *Illinois J. Math.* 46 (2002), 155-163.
- 6) (with R. Bañuelos), Space Time Brownian Motion and The Beurling-Ahlfors Transform, *Indiana Math. Journal* 52 (2003), 981-990.
- 7) An Isoperimetric Inequality for Riesz Capacities, to appear in *Rocky Mountain Mathematical Journal*.
- 8) (with D. Khoshnevisan with D.A. Levin), On Dynamical Gaussian Random Walks, to appear in *Annals of Probability*. (<http://www.imstat.org/aop>)
- 9) (with D. Khoshnevisan with D.A. Levin), Exceptional Times and Invariance for dynamical Random Walks, to appear in *Probability Theory and Related Fields*.
- 10) (with R. Bañuelos and T. Kulczycki), On the shape of the ground state eigenfunction for stable processes, to appear in *Potential Analysis*.
- 11) Intrinsic Ultracontractivity for Schrödinger operators with mixed boundary conditions, preprint.
- 12) (R. DeBlassie),  $\alpha$ -Continuity Properties of the Symmetric  $\alpha$ -Stable Process, preprint.
- 13) (with D. Khoshnevisan and D.A. Levin), Capacities in Wiener Space, Quasi-Sure Lower Functions, and Kolmogorov's  $\epsilon$ -Entropy, preprint.
- 14) Exit times of symmetric  $\alpha$ -stable processes from unbounded domains, preprint.
- 15) (with R. Bañuelos), Hotspots for conditioned Brownian motion, preprint.

## INVITED TALKS :

- 1) Stochastic and Nonlinear Analysis Seminar, University of Illinois, Urbana-Champaign, USA, October 2001.
- 2) Probability Seminar, Georgia Tech University, Atlanta, USA February 2001.
- 3) Analysis Seminar Washington University, St. Louis, USA, April 2001.
- 4) Probability Seminar, Purdue University, W. Lafayette, USA, March 2001.
- 5) PDE-Stochastic's Seminar, University of Utah, Salt Lake City, USA, December 2001.
- 6) Probability Seminar, Purdue University, W. Lafayette, USA, October 2002.
- 7) Symposium on Scattering and Spectral Theory, Universidade Federal de Pernambuco, Recife, Brazil, August 2003.
- 8) Seminar on Stochastic Processes and its Applications, Angra dos Reis, Rio de Janeiro, Brazil, August 2003.
- 9) Probability Seminar, Purdue University, W. Lafayette, USA, November 2003.
- 10) Colloquium, New Mexico State University, Las Cruces, USA, February 2004.
- 11) Probability Seminar, Purdue University, W. Lafayette, USA, abril 2005.

## ATTENDED CONFERENCES :

- 1) Analytic and Geometric Aspects of Stochastic Processes, Banff International Center, Canada, April 2004.
- 2) Midwest Probability Colloquium, Northwestern University, Chicago, USA, October 2003.
- 3) Symposium on Scattering and Spectral Theory, Universidade Federal de Pernambuco, Recife, Brazil, August 2003.
- 4) Seminar on Stochastic Processes and its Applications, Angra dos Reis, Rio de Janeiro, Brazil, August 2003.
- 5) Seminar on Stochastic Processes, University of Washington, Seattle, USA, March 2003.
- 6) Midwest Probability Colloquium, Northwestern University, Chicago, USA, October 2002.
- 7) Seminar on Stochastic processes, Princeton University, Princeton, USA, March 2002.
- 8) Midwest Probability Colloquium, University of Chicago, Chicago, USA, October 2001.
- 9) Seminar on Stochastic processes, University of Florida, Gainesville, USA, March 2001.
- 10) Midwest Probability Colloquium, Northwestern University, Chicago, USA, October 2000.
- 11) Conference on Stochastic Analysis and Harmonic Analysis, Northwestern University, Chicago, USA, July 2000.
- 12) 5th World Congress of the Bernoulli Society, Guanajuato, Mexico, May 2000.
- 13) Midwest Probability Colloquium, University of Cincinnati, Cincinnati, USA, October 1999.
- 14) AMS Sectional Meeting, University of Illinois at Urbana-Champaign, USA, March 1999.
- 15) Midwest Probability Colloquium, Northwestern University, Chicago, USA, October 1998.