April 2016

**BURGESS** **JAMES** **DAVIS**

**EDUCATION**

B.S. Ohio State 1965

M.S. University of Illinois 1966

Ph.D. University of Illinois 1968

**PROFESSIONAL EXPERIENCE**

Assistant Professor Rutgers University 1968-71

Associate Professor Rutgers University 1971-74

Associate Professor Purdue University 1974-76

Professor Purdue University 1977-2014

Professor Emeritus Purdue University 2014-

Associate Editor Annals of Probability 1981-87

Associate Editor Transactions of the AMS 1988-90

Editor Annals of Probability 1991-93

Associate Editor Illinois Journal of Math 1999-02

**PROFESSIONAL SOCIETIES AND HONORS**

Institute of Mathematical Statistics (Fellow)

One of top eleven teachers in School of Science (2000)

**RESEARCH INTERESTS**

Probability

Analysis

**VITA**

Birthdate: April 8, 1944

Birthplace: Springfield, Missouri

Citizenship: USA

**PUBLICATIONS**

1. Comparison tests for the convergence of martingales. Ann. Math. Stat. Vol. 39, December 1968, 2141-2144.

2. Comparison tests for martingale inequalities. Ann. Math. Stat. Vol. 40, April 1969, 505-508.

3. Divergence properties of some martingale transforms. Ann. Math. Stat. Vol. 40, 1969, 1852-1854.

4. Stopping rules for Sn/n and the class L log L, Z . Wahrscheinlichkeitstheorie und Verw. Gebiete, Vol. 17, 1971, 147-150.

5. On the integrability of the martingale square function. Israel J. of Math., Vol. 8, No. 2, 1970, 187-190.

6. (with D. L. Burkholder and R. Gundy) Integral inequalities for convex functions of Martingales. Proc. Sixth Berkeley Symposium of Mathematical Statistics and Probability, Vol. 2, 223-240.

7. Moments of random walk and the existence of certain optimal stopping times for Sn/n. Ill. J. of Math., 17 (1973), 75-81.

8. An inequality for the distribution of the Brownian gradient function. Proc. Amer. Math. Soc., 37 (1973), 189-194.

9. (with J. L. Lewis) An extremal property of some capacity measures in En . Proc. Amer. Math. Soc., 39 (1973), 520-524.

10. On the distributions of conjugate functions of nonnegative measures. Duke Math. J., 40 (1973), 695-701.

11. On the weak type (1,1) inequality for conjugate functions. Proc. Amer. Math. Soc., 44 (1974), 307-311.

12. Picard's theorem and Brownian motion. Trans. Amer. Math. Soc., 213 (1975), 353-361.

13. On Kolmogrov's inequality ||f|| ≤ Cp ||f||1,0 < p < 1 . Trans. Amer. Math. Soc. 222 (1976), 179-192.

14. On the Lp norms of stochastic integrals and other martingales. Duke Math. J. 43 (1976), 697-704.

15. On stopping times for n dimensional Brownian motion. Ann. Prob. 6 (1978), 651-659.

16. Brownian motion and analytic functions. Ann. Prob. 7 (1979), 913-932.

17. Brownian motion and conjugate function inequalities. Proceedings of Symposia in Pure Math. Vol. 35 (1979), 303-310.

**PUBLICATIONS (CONT.)**

18. Conjugate functions of rearranged functions. Aspects of Contemporary Complex Analysis. Proceedings of a NATO advanced study institute. (1980), 377-382.

19. Hardy spaces and rearrangements. Trans. Amer. Math. Soc. (1980), 211-233.

20. On the integrability of the ergodic maximal function. Studia Math. (1982), 153-167.

21. (with J.L. Lewis) The harmonic measure of porous membranes in. Proceedings of an AMS conference. Springer Lecture Notes 939, 29-35.

22. (with John L. Lewis) Paths for subharmonic functions. Proc. London Math. Soc.(3) 48 (1984), 401-427.

23. Brownian slow points. Zeitschrift fur Wahrschemkikeitstheorie 64 (1983), 359-367.

24. On the paths of symmetric stable processes. Trans. Amer. Math. Soc. 2 (1984), 785-794.

25. (with Itrel Monroe) Randomly started signals with white noise. Ann. Prob. 12 (1984), 922-925.

26. (with Edwin Perkins) Brownian slow points: the critical case. Ann. Prob. 13 (1985), 779-803.

27. (with Jeesen Chen and Herman Rubin) How non-uniform can a uniform sample be: A histogram approach. Probability Theory and Its Applications 73 (1986), 245-254.

28. On the Barlow-Yor inequalities for local time. (1987) Seminaire de Probabilities XXI. Springer LNM 1247, 218-220.

29. (with David Avis and J. M. Steele) Probabilistic analysis of a greedy heuristic for Euclidean matching. Probability in Information Theory and Computer Science 2 (1988), 143-156.

30. (with Tom Salisbury) Connecting Brownian paths. Ann. Prob. 16 (1988), 1428-1457.

31. Conditioned Brownian motion in planar domains. Duke Math Journal 57 (1988), 397-421.

32. (with Rodrigo Bañuelos) Heat Kernel, Eigcufunctions, and Conditioned Brownian Motion in Planar Domains. Journal of Functional Analysis 84 (1989), 188-200.

33. Loss of Recurrence in Reinforced Random Walk. Almost Everywhere Convergence. Proceedings of a Conference, Academic Press (1989), 179-189.

34. Reinforced Random Walk. Prob. Thry. Rel. Fields 84 (1990), 203-229.

35. Intrinsic Ultracontractivity and the Dirichlet Laplacian. (1991) Journal of Functional Analysis 100, 162-180.

**PUBLICATIONS (CONT.)**

36. Intrinsic Ultracontractivity and Probability. (1992) In Partial Differential Minimal Smoothness and Applications. (IMA proceedings #42, 111-114).

37. (with Rodrigo Bañuelos) A Geometric Characterization of Intrinsic Ultracontractivity in Planar Domains with Boundaries Given by the Graphs of Functions. (1992) Indiana University Math Journal, 41, 885-913.

38. (with Rodrigo Bañuelos) Sharp Estimates for Dirichlet Eigenfunctions in Horn-Shaped Regions. (1992) Communications in Mathematical Physics, 209-215.

39. (with Biao Zhang) Moments of the Lifetime of Conditioned Brownian Motion in Cones. (1994) Proceedings of the American Mathematical Society, 121, 925-929.

40. (with David McDonald) An Elementary Proof of the Local Limit Theorem. (1995) Journal of Theoretical Probability, 8, 693-701.

41. Weak Limits of Perturbed Random Walks. (1996) Ann. Prob. 24, 2007-2023.

1. Distribution of Brownian Local Time on Curves. (1998) Bull. Lon. Math. Soc., 30, 182-184.

43. Perturbed random walks and Brownian motions and local times. (1998), New York Journal of Math, 3A, 81-87. Proceedings of a conference.

44. Brownian motion and random walk perturbed at extrema. (1999) Prob. Thry. Rel. Fields, 113, 501-518.

45. Reinforced and perturbed random walks. (1999) Random Walks, 113-127, Janos Bolgai, Mathematical Society. Proceedings of a conference.

46. On the spectral gap for fixed membranes. (2001) Ark. Mat., 39, 65-74.

47. (with Stanislav Volkov) Continuous time vertex reinforced jump processes. (2002) Prob. Thry. Rel. Fields 123, 281-300.

48. (with Majid Hosseini) Ratio inequalities for heat content (2004) Journal London Math Society. 69, 97-106.

49. (with Stanislav Volkov) Vertex reinforced random jump processes on trees and finite graphs. (2004) Prob. Thry. Rel. Fields, 128, 42-62.

50. On time changing continuous martingales to Brownian motion. Institute of

Mathematical Statistics, Lecture Notes Monograph (2004), Series 45, 138-139.

51. (with Jiyeon Suh) On Burkholder’s supermartingales. (2006) Illinois Journal of Math. 50, 313-322.

52. (with Noah Dean) Recurrence and Transience preservation for vertex reinforced jump processes in one dimension. (2010) Illinois J. Math. 54, no. 3, 869-893.

53. Co-editor with Renming Song: The Selected Works of Donald Burkholder. (2011)

Springer.

54. (with Rodrigo Banuelos) Donald Burkholder’s work in martingales and analysis.

(2011). Commentary in *The Selected Works of Donald Burkholder,* Springer,

55. (with Jonathan Peterson) Excited random walks with non-nearest neighbor steps.

Submitted in 2015.

**And a little brain “science?”: Google: Burgess Davis Financial Times**

**PH. D. STUDENTS**

Joseph Petrucelli 1976

Jaiming Xu 1991

Darryl Nester 1993

Biao Zhang 1994

Majid Hosseini 2003

Andrea Collevecchio 2004

Noah Dean 2008