Richard S. Laugesen

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN
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EDUCATION

Ph.D., Mathematics, Washington University in St. Louis — May 1993
Extremal problems involving logarithmic and Green capacity
Advisor: Albert Baernstein II

B.Sc. (Hons.), University of Canterbury — May 1988

POSITIONS

Univ. of Illinois, Urbana-Champaign, Professor	2010-present
Univ. of Illinois, Urbana-Champaign, Director of Graduate Studies in Mathematics	2012-2017
Univ. of Illinois, Urbana-Champaign, Associate Professor	2001-2010
Univ. of Illinois, Urbana-Champaign, Assistant Professor	1997-2001
Johns Hopkins University, Visiting Assistant Professor	1996-1997
Institute for Advanced Study, Princeton, Member	1994-1995
University of Michigan, Ann Arbor - Hildebrandt Research Assistant Professor	1993-1996

EXTERNAL FUNDING AND FELLOWSHIPS

Institute for Mathematics and Its Applications, 2019-2020
summer funding for 12 interns and computational training (co-PI), *$59,000*

Sloan Foundation "Making way for a New Generation in STEM" 2015-2020
University Center of Exemplary Mentoring UCEM (co-PI), *$1,000,000*

Simons Foundation #429422 Collaboration Grant, *$35,000* 2016-2021

Simons Foundation #204296 Collaboration Grant, *$35,000* 2011-2016

NSF #1345032 "Program for Interdisciplinary and Industrial Internships (PI4)" 2014-2020
co-PI with Baryshnikov and DeVille, *$1,200,000*

NSF #0751046 "Illinois/Missouri Applied Harmonic Analysis Seminar", *$21,000* 2008-2011

NSF #0140481 "Wavelet Frames and Bases", *$110,949* 2002-2006

NSF # 9970228 "Eigenvalues for Vibrating Plates", *$58,843* 1999-2001

NSF # 9622837 "Extremal Problems for Eigenvalues, Heat Kernels", *$63,000* 1996-1999

NSF # 9414149 "Isoperimetric and Symmetrization Problems", *$38,337* 1994-1996

Visiting Erskine Fellowship, University of Canterbury 2005

Maclaurin Fellowship, New Zealand Institute of Mathematics and its Applications 2003

CONFERENCES CO-ORGANIZED

Sharp Eigenvalue Estimates for Partial Differential Operators (online)	Apr 2020
GROW – Graduate Opportunities for Women (lead organizer: Prof. Zoi Rapti)	Oct 2019
Będlewo *3rd Conference on Nonlocal Operators and Partial Differential Equations*	June 2016
Fifty Years of Hearing Drums: Spectral Geometry and the Legacy of Mark Kac	May 2016
Banff Workshop *Spectral Theory of Laplace and Schrödinger Operators*	July 2013
Illinois/Missouri Applied Harmonic Analysis Seminar, eight meetings	2006-2010
AMS Session *Sharp Spectral Estimates in Analysis, Geometry, and Probability*	March 2010
AMS Session *Time, Scale and Frequency Methods in Harmonic Analysis*	March 2009

Oberwolfach Workshop *Low Eigenvalues of Laplace and Schrödinger Operators* Feb. 2009
AIM Workshop *Low Eigenvalues of Laplace and Schrödinger Operators* May 2006
Midwest Partial Differential Equations Seminar Fall 1999

NOTABLE SERVICE

Director of Graduate Studies 2012-2017

- recruited 25-30 PhD students per year (with sole authority over admissions and TA funding)
- monitored progress of 160 PhD students
- recruited and mentored African-American, Latino/a and Native Hawaiian students (up from 6% to over 25% of our U.S. PhD students)
- awarded minority student fellowships through Sloan Foundation UCEM grant
- recruited women PhD students (up from 33% to 39%, almost twice the R1 average)
- spoke at American Mathematical Society Joint Meetings (2017) in sessions on Diversity and Mathematical Careers
- supervised two staff members, and coordinated with Director of Actuarial Science
- co-developed new courses and concentration
- created publicity materials for print and web publication
- organized regular career development events and panels
- mentored mathematics students into internship opportunities, through NSF PI4 grant and direct employer contacts at the UI Research Park and nationally (total summer internships increased from 6 to 31)

COVID-19 Building Usage Taskforce, chair 2020
Space Committee, Mathematics Department, chair 2007-2009

- proposed $200,000 feasibility study for building renovations
- that study later sparked a university project commitment of $27 million

Executive Committee, Mathematics Department 2004-2006

- made hiring decisions for tenure track and tenured positions
- engaged in strategic planning
- conducted salary reviews

Honors Committee, Mathematics Department 2001-2007

- developed curricula
- won approval for new courses
- monitored student success

Sloan UCEM Steering Committee and Scholarship Committee (U of Illinois) 2015-2019
American Association of University Professors (U of Illinois chapter) 2018-2019

- Vice President

Campus Faculty Association 2013-2014, 2015-2016

- Vice President
- Communications co-chair

Society for Industrial and Applied Mathematics, Career Opportunities Committee

- Member (1 year term) 2018

- Chair (2 year term) 2019&2020

BIG Math Network

- Served on Steering Committee since founding of the Network
- promoted careers in business, industry and government for mathematical scientists
- solicited blog posts, and curated materials on industry careers

PH.D. STUDENTS AND POSTDOCS

7 Ph.D. students mentored to completion
2 Ph.D. students in progress
1 postdoctoral scholar mentored

TEACHING AWARDS

Campus Award for Excellence in Graduate and Professional Teaching, Univ. of Illinois 2017
Mathematics Department Distinguished Teaching Award for Tenured Faculty 2016
Dean's Award for Excellence in Undergraduate Teaching, University of Illinois 2003
Campus Award for Excellence in Undergraduate Teaching, University of Illinois 2003

List of Teachers Rated as Excellent, *University of Illinois*
Spring 1998, Fall 1998, Spring 1999, Fall 1999, Spring 2001, Spring 2002, Fall 2002, Spring 2003, Fall 2004, Spring 2005, Spring 2006, Fall 2006, Spring 2007, Fall 2008, Spring 2009, Spring 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Spring 2017, Spring 2018, Spring 2019, Fall 2019

TEACHING EXPERIENCE

Advanced Calculus
Advanced Mathematics for Engineers
Calculus I, II, III (including "Harvard" and "Mathematica" approaches)
Fundamental Mathematics (transition to proofs)
Harmonic Analysis
Linear Algebra
ODEs with Applications
ODEs and Dynamics
Partial Differential Equations (undergraduate, and two semesters of graduate)
Precalculus I and II
Probability (undergraduate, and one semester of graduate)
Real Analysis (graduate)
Special topics: Spectral Theory for Partial Differential Equations; Calculus of Variations; Frames in Harmonic Analysis; Scaling, Self-similarity and Intermediate Asymptotics

INVITED TALKS

2020

U. of Naples (Italy)

2019

U. of Lisbon, American Institute of Mathematics (San Jose) workshop speaker on "Shape

optimization with surface interactions", U. of Missouri, Conference on "Shape Optimization and Isoperimetric and Functional Inequalities" (Italy)

2018

American Institute of Mathematics (San Jose) workshop participant on "Steklov eigenproblems", Graduation speaker for PhD and Masters recipients (U. of Illinois Graduate College), New Mexico State U. (colloquium), New Zealand Mathematical Society annual meeting (Dunedin), Canadian Mathematical Society winter meeting (Vancouver), Conference on "Results in Contemporary Mathematical Physics" (Santiago, Chile)

2017

U. of West Georgia, Associated Colleges of the Chicago Area (undergraduate colloquium), U. of Pittsburgh (colloquium), Spectral Days Conference (Stuttgart), U. of Washington, U. of Lisbon

2016

Rose-Hulman Institute of Technology undergraduate colloquium, MAA Sectional Plenary Address (Jacksonville, IL), Conference on “Fifty Years of Hearing Drums: Spectral Geometry and the Legacy of Mark Kac” (Santiago, Chile), Mini-course on “Spectral Theory of elliptic differential operators” at the CRM Summer school on Spectral Theory and Applications (U. Laval), CIRM-Luminy conference “Shape optimization, Isoperimetric and Functional Inequalities”

2015

Banff Workshop on Laplacians and Heat Kernels: Theory and Applications, Nazarbayev U., U. Laval, U. Montreal, ICMS Edinburgh Workshop on Shape Optimization and Spectral Geometry

2014

Illinois Wesleyan U. (Natural Science Colloquium), Oklahoma State U. (colloquium), U. of Oregon, MSRI-UP undergraduate colloquium, Red Raider Symposium (Texas Tech U.), Bradley U. (colloquium)

2013

Purdue U. (colloquium), U. of Missouri at Columbia, Workshop on Spectral Theory and Geometry (Neuchatel), SIAM minisymposium on Laplacian Spectra for Shape Optimization, Classification, Recognition, and Beyond (San Diego)

2012

U. of Oregon (colloquium), U. of Oregon, CIRM-Luminy conference Shape Optimization Problems and Spectral Theory, Oberwolfach workshop Geometric Aspects of Spectral Theory, De Giorgi Center-Pisa workshop Geometric and Analytic Techniques in Calculus of Variations and PDEs

2011

International Conference on Harmonic Analysis and Applications (Macquarie University), Otago U., Oklahoma State U. (colloquium), Washington U. in St. Louis

2010

International Conference on the Isoperimetric Problem of Queen Dido and its Mathematical Ramifications (Carthage, Tunisia), U. of Arizona (colloquium), U. of Arizona

2009

U. of Kentucky, Conference on Twenty Years of Wavelets (DePaul U., Chicago), Conference on Time-Frequency (Strobl, Austria)

2008

New Mexico State U., U. of Canterbury, Technical U. of Denmark, Symposium on Computational Harmonic Analysis (U. Missouri, St. Louis), 7th Australia-New Zealand Mathematics Convention

2007

Conference on Trends in Harmonic Analysis (Strobl, Austria), SIAM Special Session (Memphis), Illinois/Missouri Applied Harmonic Analysis Seminar, Vanderbilt U.

2006

International Conference on Harmonic Analysis (Merlo, Argentina), Dalhousie U., U.S.-Croatian Workshop on Wavelets (Washington U. in St. Louis)

2005

U. Missouri at Columbia, Conference on Modern Methods of Time-Frequency Analysis (Austria), Washington U. in St. Louis (Loeb Undergraduate Lecture), U. Minnesota

2004

Washington U. in St. Louis, Iowa State U., Workshop on Harmonic and Functional Analyses of Wavelets (Singapore), U. Basel, U. Autonoma de Barcelona, National U. of Singapore, U. of Canterbury, U. of Auckland

2003

U. of Auckland, Massey U., Victoria U., U. of Otago, U. of Toronto, Indiana U., Michigan State

2002

Oklahoma State U., Washington U. in St. Louis

2001

Texas Tech U., U. Basel, Oberwolfach Conference "Elliptic and Parabolic Problems of Higher Order", U. of Canterbury, Indiana U.

2000

Washington U. in St. Louis, U. of Missouri

1999

Edinburgh Conference “Dynamics of Thin Fluid Films”, Oklahoma State U., Northwestern U.

1998

Wabash seminar, Purdue U., U. of Virginia, Washington U., Wright State U., Oberwolfach Conference "Geometric Questions in Partial Differential Equations".

1997

Vanderbilt Conference on Differential Equations, U. of Illinois (Urbana-Champaign), U. of Illinois (Chicago), Northwestern U., U. of Missouri, Georgia Tech.

1996

Rice U., Washington U., Georgetown U., George Washington U., U. of Arkansas, U. of Maryland at College Park, Purdue U. MSRI Conference "Sharp Inequalities", Mt. Holyoke Meeting "Optimization Methods in PDE", Oberwolfach workshop "Geometric Function Theory"

1995

Wayne State U., Technion in Haifa, Cornell U., Brown U., SUNY at Stony Brook, Institute for Advanced Study

1994

Florida State U., Washington U., U. of Auckland, U. of Canterbury

1993

SUNY at Stony Brook, U. of Auckland

1992
U. of Michigan, Purdue U., U. of Illinois at Urbana, Justus-Liebig U. (Germany), York U.

AMS Special Sessions in 1994-2015
East Lansing, Knoxville, St. Louis, Lexington, Urbana, Baton Rouge, Chicago, Eugene, Pittsburgh, Lawrence, Birmingham, South Bend, Winston--Salem, Chicago, Louisville, Columbia (MO), Chattanooga, Orlando, Hartford, Cincinnati

PANELS

"How to Recruit Alliance Students", Field of Dreams conference, 2018 and 2019
"Careers in Government and Industry", Field of Dreams conference, 2018
"The BIG Math Network", SIAM Annual Meeting, 2018
"Strategies for Diversifying Graduate Mathematics Programs", AMS Joint Meetings, 2018.
"Paths to the Doctorate: Surviving the Graduate Program" Field of Dreams conference, 2017

PROFESSIONAL MEMBERSHIPS

American Association of University Professors (AAUP)
American Mathematical Society (AMS)
Campus Faculty Association (CFA)
Society for Industrial and Applied Mathematics (SIAM)

PUBLICATIONS

Authors are usually listed alphabetically on Mathematics papers. Co-authors are indicated below.

1. The effect of social distancing, isolation and digital contact tracing on COVID-19
   (With S. Grice, H. Locke and P. Grice).
   Technical report, 11 pages.
2. Well-posedness of Hersch–Szegö's center of mass by hyperbolic energy minimization
   Submitted. 29 pages.
3. Well-posedness of Weinberger's center of mass by euclidean energy minimization
   Journal of Geometric Analysis, appeared online, 18 pages.
4. Robin spectrum: two disks maximize the third eigenvalue
   (With A. Girouard.)
   Indiana University Mathematics Journal, to appear. 32 pages.
5. From Steklov to Neumann and beyond, via Robin: the Szegő way
   (With P. Freitas.)
   Canadian Journal of Mathematics, appeared online. 20 pages.
6. From Neumann to Steklov and beyond, via Robin: the Weinberger way

(With P. Freitas.)
American Journal of Mathematics, to appear. 23 pages.

7. The Robin Laplacian - spectral conjectures, rectangular theorems
Journal of Mathematical Physics, 60 (2019), 121507. 32 pages.

8. BIG career developments for mathematics graduate students
(With R. Levy and F. Santosa.)
Notices of the American Mathematical Society, 66 (2019), 523-524.

9. Symmetrization in Analysis
(By Albert Baernstein II, with David Drasin and Richard Laugesen.)
Cambridge University Press, 2019. 474 pages.

10. Pólya's conjecture fails for the fractional Laplacian
(With M. Kwaśnicki and B. A. Siudeja.)
Journal of Spectral Theory, 9 (2019), 127–135.

11. BIG Jobs Guide: Business, Industry, and Government Careers for Mathematical Scientists, Statisticians, and Operations Researchers
(By Rachel Levy, Richard Laugesen, and Fadil Santosa.)
SIAM book series, 2018. 141 pages.

12. Spectral Theory of Partial Differential Equations
In: Spectral Theory and Applications, Contemporary Mathematics, vol. 720, American Mathematical Society, Providence, RI, 2018, pp. 23-55. (Proceedings of the 2016 CRM Summer School on Spectral Theory and Applications.)

13. Shifted lattices and asymptotically optimal ellipses
(With S. Liu.)
The Journal of Analysis, 26 (2018), 71-102.

14. Optimal stretching for lattice points and eigenvalues
(With S. Liu.)
Arkiv för Matematik, 56 (2018), 111-145.

15. Optimal stretching for lattice points under convex curves
(With S. Ariturk.)
Portugaliae Mathematica (N.S.), 74 (2017), 91-114.

16. Triangles and Other Special Domains
(With B. A. Siudeja.)
Chapter 6 (pp. 149-200) in the book *Shape Optimization and Spectral Theory*, edited by Antoine Henrot, De Gruyter Open, 2017.

17. Math PhD careers: new opportunities emerging amidst crisis
(With Y. Baryshnikov and R. DeVille.)
Notices of the American Mathematical Society 64 (2017), 260-264.

18. Preparing graduates for careers in the mathematical sciences
(With S. Minkoff, W. Menasco, F. Santosa, S. Pankavich.)
SIAM News 49 (2016).

19. Torsion and ground state maxima: close but not the same
(With B. A. Benson, M. Minion and B. A. Siudeja.)
Bulletin of the Irish Mathematical Society 78 (2016), 81-88.

20. Steklov eigenvalues and quasiconformal maps of simply connected planar domains
(With A. Girouard and B. A. Siudeja.)
Archive for Rational Mechanics and Analysis 219 (2016), 903-936.

21. Multivariable feedback particle filter
(With T. Yang, P. G. Mehta and S. Meyn.)
Automatica 71 (2016), 10-23.

22. Poisson's equation in nonlinear filtering
(With P. G. Mehta, S. Meyn, and M. Raginsky.)
SIAM Journal on Control and Optimization 53 (2015), 501-525.

23. Magnetic spectral bounds on starlike plane domains
(With B. A. Siudeja.)
ESAIM: Control, Optimisation and Calculus of Variations 21 (2015), 670-689.

24. Sharp spectral bounds on starlike domains
(With B. A. Siudeja.)
Journal of Spectral Theory 4 (2014), 309-347.

25. Explicit interpolation bounds between Hardy space and L^2
(With H.-Q. Bui.)
Journal of the Australian Mathematical Society 95 (2013), 158-168.

26. Wavelet frame bijectivity on Lebesgue and Hardy spaces
(With H.-Q. Bui.)
Journal of Fourier Analysis and Applications 19 (2013), 376-409.

27. Multivariable feedback particle filter
(With T. Yang, P. G. Mehta and S. Meyn.)
2012 IEEE 51st Annual Conference on Decision and Control (CDC), (Dec. 2012), 4063-4070.

28. Tight frames and rotations: sharp bounds on eigenvalues of the Laplacian
In: Proceedings of the AMSI International Conference on Harmonic Analysis and Applications (Macquarie University, February 2011), pp. 63-82. Edited by X. Duong, J. Hogan, C. Meaney, A. Sikora.

29. Uniqueness for the continuous wavelet transform
(With H.-Q. Bui.)
Far East Journal of Applied Mathematics 65 (2012), 1-11.

30. Sums of magnetic eigenvalues are maximal on rotationally symmetric domains
(With J. Liang and A. Roy.)
Annales Henri Poincare 13 (2012), 731-750.

31. Neumann eigenvalue sums on triangles are (mostly) minimal for equilaterals
(With Z. C. Pan and S. S. Son.)

Mathematical Inequalities and Applications 15 (2012), 381-394.

32. Rebuttal of Donnelly's paper on the spectral gap
(With M. S. Ashbaugh and A. Henrot.)
Mathematische Zeitschrift 269 (2011), 5-7.

33. Dirichlet eigenvalue sums on triangles are minimal for equilaterals
(With B. A. Siudeja.)
Communications in Analysis and Geometry 19 (2011), 855--885.

34. Sums of Laplace eigenvalues - rotations and tight frames in higher dimensions
(With B. A. Siudeja.)
Journal of Mathematical Physics 52 (2011), 093703. 13 pages.

35. Sums of Laplace eigenvalues - rotationally symmetric maximizers in the plane
(With B. A. Siudeja.)
Journal of Functional Analysis 260 (2011), 1795-1823.

36. Approximately dual frames in Hilbert spaces and applications to Gabor frames
(With O. Christensen.)
Sampling Theory in Signal and Image Processing 9 (2011), 77-90.

37. Wavelets in Littlewood-Paley space, and Mexican hat completeness
(With H.-Q. Bui.)
Applied and Computational Harmonic Analysis 30 (2011), 204-213.

38. Frequency-scale frames and the solution of the Mexican hat problem
(With H.-Q. Bui.)
Constructive Approximation 33 (2011), 163–189.

39. Moment inequalities for equilibrium measures in the plane
(With A. Baernstein II and I. E. Pritsker.)
Pure and Applied Mathematics Quarterly 7 (2011), 51-86.

40. Minimizing Neumann fundamental tones of triangles: an optimal Poincare inequality
(With B. A. Siudeja.)
Journal of Differential Equations 249 (2010), 118-135.

41. Maximizing Neumann fundamental tones of triangles
(With B. A. Siudeja.)
Journal of Mathematical Physics 50:112903, 2009. 22 pages.

42. Gabor dual spline windows
Applied and Computational Harmonic Analysis 27:180-194, 2009.

43. A computable Fourier condition generating alias-free sampling lattices
(With Y. M. Lu and M. N. Do.)
IEEE Transactions on Signal Processing 57:1768-1782, 2009.

44. A note on constructing affine systems for L^2
(With H.-Q. Bui and N. Kaiblinger.)
Applied and Computational Harmonic Analysis 25:400-406, 2008.

45. Affine synthesis onto L^p when $0 < p <= 1$
Journal of Fourier Analysis and Applications 14:235-266, 2008.

46. Affine synthesis onto Lebesgue and Hardy spaces
(With H.-Q. Bui.)
Indiana University Mathematics Journal 57:2203-2233, 2008.

47. Sobolev spaces and approximation by affine spanning systems
(With H.-Q. Bui.)
Mathematische Annalen 341:347-389, 2008.

48. Approximation and spanning in the Hardy space, by affine systems
(With H.-Q. Bui.)
Constructive Approximation 28:149-172, 2008.

49. On convex surfaces with minimal moment of inertia
(With P. Freitas and G. F. Liddell.)
Journal of Mathematical Physics 48, 122902, 2007.

50. On affine frames with transcendental dilations
Proceedings of the American Mathematical Society 135:211-216, 2007.

51. Affine systems that span Lebesgue spaces
(With H.-Q. Bui.)
Journal of Fourier Analysis and Applications 11:533-556, 2005.

52. New dissipated energies for the thin fluid film equation
Communications on Pure and Applied Analysis 4:613-634, 2005.

53. Another way to say subsolution: the maximum principle and sums of Green functions
(With N. A. Watson.)
Mathematica Scandinavica 97:127-153, 2005.

54. Potential theory of the farthest-point distance function
(With Igor E. Pritsker.)
Canadian Mathematical Bulletin 46:373-387, 2003.

55. Heteroclinic orbits, mobility parameters and stability for thin film type equations
(With Mary C. Pugh.)
Electronic Journal of Differential Equations 2002: No. 95, 1-29.

56. Energy levels of steady states for thin film type equations
(With Mary C. Pugh.)
Journal of Differential Equations 182:377-415, 2002.

57. A characterization of the higher dimensional groups associated with continuous wavelets
(With Nik Weaver, Guido Weiss and Edward Wilson.)
Journal of Geometric Analysis 12:89-102, 2002.

58. Translational averaging for completeness, characterization and oversampling of wavelets
Collectanea Mathematica 53:211-249, 2002.

59. Completeness of orthonormal wavelet systems, for arbitrary real dilations
Applied and Computational Harmonic Analysis 11:455-473, 2001.

60. Linear stability of steady states for thin film and Cahn-Hilliard type equations
(With Mary C. Pugh.)
Archive for Rational Mechanics and Analysis 154:3-51, 2000.

61. Properties of steady states for thin film equations
(With Mary C. Pugh.)
European Journal of Applied Mathematics 11(3):293-351, 2000.

62. Binary forms, equiangular polygons and harmonic measure
(With Michael A. Bean.)
Rocky Mountain Journal of Mathematics 30:15-62, 2000.

63. Eigenvalues of strings and cylinders with variable mass density
Communications in Analysis and Geometry 8:393-443, 2000.

64. Eigenvalues of the Laplacian on inhomogeneous membranes
American Journal of Mathematics 120:305-344, 1998.

65. Eigenvalues of Laplacians with mixed boundary conditions, under conformal mapping
Illinois Journal of Mathematics 42:19-39, 1998.

66. Extremals for eigenvalues of Laplacians under conformal mapping
(With Carlo Morpurgo.)
Journal of Functional Analysis 155:64-108, 1998.

67. Planar harmonic maps with inner and Blaschke dilatations
Journal of the London Mathematical Society 56:37-48, 1997.

68. Inequalities for the first eigenvalues of the clamped plate and buckling problems
(With Mark S. Ashbaugh and Rafael D. Benguria.)
In: International Series of Numerical Mathematics, Volume 123 (Proceedings of the Oberwolfach Conference "General Inequalities 7"), pp. 95-110, 1997.

69. Fundamental tones and buckling loads of clamped plates
(With Mark S. Ashbaugh.)
Annali della Scuola Normale Superiore di Pisa 23:383-402, 1996.

70. The argument principle for harmonic functions
(With Peter L. Duren and Walter Hengartner.)
American Mathematical Monthly 103:411-415, 1996

71. Injectivity can fail for higher-dimensional harmonic extensions
Complex Variables 28:357-369, 1996.

72. Conformal mapping of long quadrilaterals and thick doubly connected domains
Constructive Approximation 10:523-554, 1994.

73. Extremal problems involving logarithmic and Green capacity
Duke Mathematical Journal 70:445-480, 1993.