

CURRICULUM VITAE

Updated June 2018

1. PERSONAL INFORMATION

Mike Boyle
Professor Emeritus, Department of Mathematics
U.S. Citizen, born 1951

Educational background

Ph.D. Mathematics, University of Washington, Seattle, 1983
A.B. Mathematics, University of California, Berkeley, 1977
B.S. Chemistry, University of California, Berkeley, 1977
B.A. Psychology, Stanford University, 1974

Employment background

Professor Emeritus, University of Maryland, 2017 - .
Professor, University of Maryland, 1993-2016
Associate Professor, University of Maryland, 1989-1993
Assistant Professor, University of Maryland, 1984-1989 Department of Math.
T.J. Watson Postdoctoral Research Fellow, IBM Watson Research Center, Yorktown Heights NY
Sept. 1984-Aug. 1985
Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley CA, Sept. 1983-Aug. 1984

2. RESEARCH, SCHOLARLY, AND CREATIVE ACTIVITIES

a. Articles published, or accepted for publication, in refereed research journals

1. Lower entropy factors of sofic systems. Erg. Th. Dyn. Syst. Vol. 3, Part 4. pp. 541-557, Dec. 1983.
2. with S. Tuncel. Infinite-to-one codes and Markov measures. Trans. AMS Vol. 285, No. 2, pp. 657-684, Oct. 1984.
3. Shift equivalence and the Jordan form away from zero. Erg. Th. Dyn. Syst., Vol. 4, Part 3, pp. 367-379, Sept. 1984.
4. with B. Kitchens and B. Marcus. A note on minimal covers of sofic systems. Proc. AMS, Vol. 95, No. 3, pp. 403-411, Nov. 1985.
5. Constraints on the degree of a sofic homomorphism and the induced multiplication of measures on unstable sets, Israel J. Math., Vol. 53, No. 1, pp. 52-68, 1986.
6. with W. Krieger. Periodic points and automorphisms of the shift, Trans. AMS Vol. 302, No. 1, pp. 125-149, 1987.
7. with B. Marcus and P. Trow. Resolving maps and the dimension group for shifts of finite type, Memoirs of the AMS, No. 377, 146 pages, 1987.
8. with D. Lind and D. Rudolph. The automorphism group of a shift of finite type. Trans. AMS, Vol. 306, No. 1, pp. 71-114, 1988.
9. Eventual extensions of finite codes. Proc. AMS, Vol. 104, No. 2, pp. 1-7, 1988.
10. A zeta function for homomorphisms of dynamical systems, Journal of the London Math. Soc., Vol. 40, Part 2, pp. 355-368, 1989.
11. with J. Franks and B. Kitchens. Automorphisms of one-sided subshifts of finite type, Erg. Th. Dyn. Syst., 10, 421-449, 1990.
12. with S. Tuncel. Regular isomorphism of Markov shifts is almost topological, Erg. Th. Dyn. Syst., 10, 89-100, 1990.

13. with U. Fiebig. The action of inert finite order automorphisms on finite subsystems of the shift, *Erg. Th. Dyn. Syst.*, 11 (1991), 413-425.
14. with D. Handelman. The spectra of nonnegative matrices via symbolic dynamics. *Annals of Math.*, 133, 249-316, 1991.
15. Almost flow equivalence for hyperbolic basic sets. *Topology* 31 (1992), 857-864.
16. with D. Handelman. Primitive matrices and algebraic shift equivalence. *Trans. AMS*, 336 (1993), 121-149.
17. with W. Krieger. Automorphisms and subsystems of the shift. *J. reine angew. Math. (Crelle's J.)* 437 (1993), 13-28.
18. with D. Handelman. Entropy versus orbit equivalence for minimal homeomorphisms, *Pacific J. Math.*, Vol. 64, No. 1 (1994), pp. 1-13.
19. with D. Lind. Expansive subdynamics. *Trans. AMS*, Vol. 349, No. 1 (1997), 55-102.
20. with D. Handelman. Orbit equivalence, flow equivalence, and ordered cohomology, *Israel J. Math.* 95 (1996), 169-210.
21. Factoring Factor Maps, *J. London Math. Soc. (2)* 57 (1998), 491-502.
22. with J. Tomiyama. Bounded topological orbit equivalence and C^* -algebras, *J. Math. Society of Japan*, Vol. 50, No. 2 (1998), 317-329.
23. with D. Fiebig and U. Fiebig. A dimension group for local homeomorphisms and endomorphisms of onesided shifts of finite type, *J. reine angew. Math.* 487 (1997), 27-59.
24. with B. Kitchens. Periodic points for onto cellular automata, *Indagationes Mathem., N.S.*, 10 (4), (1999), 483-493.
25. A homeomorphism good on measures and bad on orbits, Appendix to Real coboundaries for minimal Cantor systems by N. Ormes, *Pacific J. Math.* 195 (2000), no.2, 473-475.
26. with A. Maass. Expansive invertible onesided cellular automata, *J. Math. Society of Japan* 52 (2000), no. 4, 725-740; Erratum, *J. Math. Society of Japan* 55 (2003), no. 4.
27. with D. Fiebig and U. Fiebig. Residual entropy, conditional entropy and subshift covers, *Forum Math.* 14 (2002), 713-757.
28. Flow equivalence of shifts of finite type via positive factorizations, *Pacific J. Math.* 204 (2002), no.2, 273-317.
29. with D. Huang. Poset block equivalence of integral matrices, *Trans. AMS* 355 (2003), no. 10, 3861-3886.
30. with D. Lind. Small polynomial matrix presentations of nonnegative matrices, *Linear Algebra and its Applications* 355 (2002), 49-70.
31. with T. Downarowicz. The entropy theory of symbolic extensions, *Inventiones Math.* 156 (2004), 119-161.
32. Some sofic shifts cannot commute with nonwandering shifts of finite type, *Illinois J. Math.* 48, Number 4 (2004), 1267-1277.
33. with M. Sullivan, Equivariant flow equivalence for shifts of finite type, by matrix equivalence over group rings, *Proceedings of the London Math. Soc.* 91 (2005), 184-214.
34. with J. Buzzi and R. Gomez, Almost isomorphism for countable state Markov shifts, *J. Reine angew. Math.* 592 (2006), 23-47.
35. Putnam's resolving maps in dimension zero, *Erg. Th. Dyn. Syst.* 25 (2005), no. 5, 1485-1502.
36. with Tomasz Downarowicz, Symbolic extension entropy: C^r examples, products and flows, *Discrete and Continuous Dynamical Systems* 16, Number 2 (2006), 329-341.
37. with Jerome Buzzi and Ricardo Gomez, Good potentials for almost isomorphism of countable state Markov shifts, *Stochastics and Dynamics* 7 (2007), no. 1, 1-15.

38. with Bryant Lee, Jointly periodic points in cellular automata: computer explorations and conjectures, *Experimental Mathematics* 16 (2007), No.3, 293-302.
39. with Michael Schraudner, Z^d group shifts and Bernoulli factors, *Ergodic Theory and Dynamical Systems* 28 (2008), no.2, 367-387.
40. with Michael Schraudner, Z^d shifts of finite type without equal entropy full shift factors, *J. Difference Equations and Applications*, 15 (2009), no. 1, 47-52.
41. with R. Pavlov and M. Schraudner, Multidimensional sofic shifts without separation and their factors, *Transactions AMS* 362 (2010), 4617-4653.
42. with H.K. Kim and F.W. Roush, Path methods for strong shift equivalence of positive matrices, *Acta Applicandae Mathematicae*, Vol. 126, Issue 1 (2013), 65-115.
43. with J. Buzzi and R. Gomez, Borel Isomorphism of SPR Markov Shifts, *Colloquium Math.* 137 (2014), no. 1, 127-136.
44. with J. Buzzi and K. McGoff, Bowen's entropy conjugacy conjecture is true up to finite index, *Proc. Amer. Math. Soc.* 143 (2015), no. 7, 2991-2997.
45. with Scott Schmieding, Strong shift equivalence and the generalized spectral conjecture for nonnegative matrices, *Linear Algebra Appl.* 498 (2016), 231-243.
46. with J. Buzzi, The almost Borel structure of surface diffeomorphisms, Markov shifts and their factors, *J. Eur. Math. Soc. (JEMS)* 19 (2017), no. 9, 2739-2782.
47. with Scott Schmieding, Finite group extensions of shifts of finite type: K-theory, Parry and Livsic. *Ergodic Theory Dynam. Systems* 37 (2017), No. 4, 1026-1059.
48. with Toke Carlsen and Soren Eilers, Flow equivalence of G-SFTs, 50 pages, to appear, *Transactions AMS* (following revision).
49. with Toke Carlsen and Soren Eilers, Flow equivalence and isotopy for subshifts. *Dyn. Syst.* 32 (2017), no. 3, 305-325; Corrigendum, *Dyn. Syst.* 32 (2017), no. 3, ii.
50. with Scott Schmieding, Strong shift equivalence and algebraic K-theory, 49 pages, to appear, *Crelles' Journal*.
51. with Toke Carlsen and Soren Eilers, Flow equivalence of sofic shifts, *Israel J. Math.* 225 (2018), no.1, 111-146.
52. with Sompong Chuysurichay, The mapping class group of a shift of finite type, 28 pages, to appear, *J. Modern Dynamics*.

b. Articles in proceedings of symposia, conferences, etc.

1. Nasu's simple automorphisms. *Dynamical Systems - Maryland 1986-1987, Proceedings of a Special Year*, ed. J. Alexander, Springer Lecture Notes 1342, Springer-Verlag, pp. 23-32, 1988.
2. with W. Krieger. Almost Markov and shift equivalent sofic systems. *Dynamical Systems-Maryland 1986-1987, Proceedings of a Special Year*, ed. J. Alexander, Springer Lecture Notes 1342, Springer-Verlag, pp. 33-93, 1988.
3. The stochastic shift equivalence conjecture is false. *Contemporary Math.* 135 (1992), 107-110. in *Symbolic Dynamics and its Applications*.
4. Review of "Introduction to Symbolic Dynamics and Coding", by Marcus and Lind, *SIAM Rev.* Vol. 39, No. 2 (1997), 334-335.
5. with Jack Wagoner, Positive algebraic K-theory and shifts of finite type, *Modern Dynamical Systems and Applications*, Cambridge University Press (2004), 45-66.
6. with Michael C. Sullivan, Almost flow equivalence; appendix to the article "Twistwise flow equivalence and beyond" by Michael C. Sullivan, *Contemporary Mathematics* 385 (2005), Algebraic and topological dynamics, eds. S. Kolyada, Y. Manin and T. Ward.
7. Open problems in symbolic dynamics, in "Geometric and Probabilistic Structures in Dynamics", eds. K. Burns, D. Dolgopyat and Y. Pesin, *Contemporary Mathematics* 469 (2008), pp. 69-118.

c. Articles submitted for publication

d. Primarily expository articles

1. Symbolic dynamics and matrices, in Combinatorial and Graph-Theoretical Problems in Linear Algebra. The IMA Volumes in Mathematics and its Applications, Vol.50 (1993), eds. R.A. Brualdi, S. Friedland and V. Klee, pp. 1-38.
2. Algebraic aspects of symbolic dynamics (among collected lectures from Temuco 1998 School in Symbolic Dynamics), in Topics in Symbolic Dynamics and Applications (2000), eds. F. Blanchard, A. Maass and A. Nogueira, Cambridge Univ. Press, pp. 57-88.
3. Positive K-theory and symbolic dynamics, in Dynamics and Randomness (2002), editors A. Maass, S. Martinez and J. San Martin, pp. 31-52; Vol. 7 of Nonlinear Phenomena and Complex Systems, Kluwer Academic Publishers.
4. with Karl Petersen, Hidden Markov processes in the context of symbolic dynamics, pp. 5-71, in Entropy of Hidden Markov Processes and Connections to Dynamical Systems, London Math. Society Lecture Note Series 385, Cambridge University Press, 2011.
5. with Benjamin Weiss, Remembering Dan Rudolph. Ergodic Theory Dynam. Systems 32 (2012), no. 2, 319-322.
6. Remembering Ki Hang Kim. Acta Applicandae Mathematicae, Vol. 126, Issue 1 (2013), 3-5.
7. The work of Kim and Roush in symbolic dynamics, Acta Applicandae Mathematicae, Vol. 126, Issue 1 (2013), 17-27.
8. Daniel J. Rudolph (1949-2010), Notices Amer. Math. Soc. 60 (2013), no.9, 1177.

d. AWARDS AND OUTSIDE SUPPORT

MHEC co-PI UMCP/PGCPS Partnership Program Feb. 2008 - July 2009

NSF co-PI with several in UMD dynamics group for NSF grant support for 3 1/2 day spring dynamics conference, most recently through 2012. (This 3 1/2 spring conference at UMD has run annually beginning 1992.)

NSF half Summer support, etc.: Summer 2004- Spring 2007

NSF half Summer support, etc.: Summer 1997- Spring 2000

NSF summer support etc.: Summer 1986-Spring 1997

IRAD GRANT (via IBM), Summer 1986.

Principal Investigator for NSF support of C. Silva's visit to College Park, 1987-8.

Millman Endowment, Summer 1988

Graduate Research Board Semester Research Award (College Park), 1992

MSRI (Symbolic Dynamics Program Participant), Fall 1992

MSRI (Research Professor), Spring 1993

Corecipient of Hans Schneider Prize of the International Linear Algebra Society 1996

e. SUPPORTED LONG VISITS

Ottawa Summer 1985 (1 month)

Warwick Summer 1986 (6 weeks)

Heidelberg Summer 1987 (3 months)

Seattle Summer 1988 (3 months)

Seattle Summer 1989 (10 weeks)

Summer 1990: Seattle (3 weeks), Heidelberg (3 weeks), Ottawa (1 week)

Montreal Summer 1991 (2 weeks)

Japan Summer 1992 (3 weeks)

Israel June 1993 (4 weeks)

Warwick July-August 1994 (4 weeks)

Marseille/Luminy, Summer 1995 (5 weeks)

Heidelberg, Summer 1995 (2 weeks)

Heidelberg, Summer 1996 (2 weeks)
 Santiago/Temuco, January 1997 (3 weeks)
 Santiago, December 1998 - January 1999 (3 - 4 weeks)
 Seattle 1999-2000 (1/2 salary for sabbatical)
 Santiago December 2000 - January 2001 (3-4 weeks)
 Warwick July 2003 (2 weeks)
 Seattle August 2003 (3 weeks)
 Max Plank Institute (Bonn) June-July 2004 (4 weeks)
 Santiago December 2004 - January 2005 (one month)
 Palaiseau (Ecole Polytechnique) January 2006 (one month)
 Santiago, August 2006-February 2007 ("Dassault Chair")
 Aarhus (1 week) and Copenhagen (3 weeks), June 2008
 Santiago December 2008 - January 2009 (one month)
 Copenhagen (University of Copenhagen) June 2010 (one month)
 Orsay (Universite Paris-Sud), May/June 2012, 2 weeks
 Copenhagen (University of Copenhagen) September-November 2013 (three months)
 Orsay (U. Paris Sud) December 2013 - January 2014 (2 months)
 Ottawa (U. Ottawa) March-midMay 2014 (2 1/2 months)
 Vancouver (U. British Columbia) midMay-midAugust 2014; PIMS Distinguished Visitor and UBC
 Visiting Professor (3 months)

e. Invited talks

November 1984, CUNY Dynamical Systems Seminar (New York)
 November 1984, IAS Cellular Automata Seminar, (Princeton)
 November 1985, Northwestern University (Evanston)
 November 1985, George Washington University (Washington,D.C.)
 June 1986, University of Warwick (England), 4 lectures
 December 1986, Symbolic dynamics conference (College Park)
 April 1987, AMS regional conference, symbolic dynamics and cellular automata section (Newark)
 June 1987, University of Heidelberg (Germany), 3 lectures
 June 1987, Colloque: Arithmetique des systemes code (CIRM, Luminy, France)
 July 1987, Symbolic dynamics conference (Heidelberg, Germany)
 October 1987, Midwest Dynamical Systems Conference (Boston)
 March 1988, IAS Dynamics Seminar (Princeton)
 March 1988, University of California, Dynamics Seminar (Berkeley)
 March 1988, IBM Almaden Research Center (San Jose)
 April 1988, CUNY Dynamics Seminar (New York)
 May 1989, Bryn Mawr (Philadelphia)
 April 1989, University of South Alabama (Mobile)
 July 1989, Conference on Ergodic Theory and Symbolic Dynamics (Seattle), 3 lectures
 August 1989, Second Conference of the Canadian Number Theory Association (Vancouver), 25-
 minute talk
 October 1990, George Washington University (D.C.)
 October 1990, Penn State/Maryland Regional Dynamics Conference (Penn State)
 April 1991, IBM Watson Research Center (Yorktown Heights)
 July 1991, Symbolic Dynamics Conference in honor of Roy Adler (Yale)
 September 1991, Arithmetics and Symbolic Dynamics (CIRM, Luminy, France)
 November 1991, IMA Workshop on Combinatorial and Graph-theoretic Problems in Linear Algebra
 (IMA, Minnesota)
 March 1992, American University (Washington, DC)
 July 1992, Tsuda College (Tokyo)
 July 1992, Keio University (Yokohama)
 July 1992, Mie University (Tsu)
 July 1992, Summer Ergodic Theory conference (Sapporo), 4 lectures

December 1992, MSRI, Area III Seminar
 April 1993, U.C. Berkeley Dynamics Seminar
 May 1993, The Technion (Haifa), 3-lecture series
 June 1993, The Technion, Matrix Theory International Conference
 June 1993, The Technion, Non-negative Matrices, International Workshop (30 minutes)
 June 1993, Beer-Sheva, Department Colloquium
 April 1994, George Mason University, Department Colloquium
 April 1994, College of William and Mary
 April 1994, Northeast Dynamics, Conference (Stony Brook)
 July 1994, Warwick, Ergodic theory of Z^d actions, International Workshop, 2 lectures
 August 1994, Delft, Ergodic theory and dynamical systems conference
 August 1994, Rotterdam, International Linear Algebra Society annual meeting (30 minutes)
 October 94, Fields Institute (Waterloo Canada), Workshop on C^* -algebras and Dynamical Systems.
 July 1995, CIRM, Luminy, France, Arithmetics and Dynamics Conference
 July 1995, Heidelberg, Krieger's Seminar
 October 1995, Penn State, Maryland - Penn State Dynamics Conference
 November 1995, Howard University, Math Dept. Colloquium
 June 1996, Mt. Holyoke, Classification problems in C^* -algebras and dynamics
 August 1996, Chemnitz, ILAS meeting, Hans Schneider Prize talk
 January 1997, Temuco, Symbolic Dynamics School, 4 lectures
 March 1997, Memphis, AMS Regional Meeting, Special Session in Symbolic Dynamics (short talk)
 March 1998, Fairfax, Southeast Dynamics and Topology Conference
 December 1998, Santiago, Complexity Fiesta
 June 1999, IBM Yorktown Heights, seminar
 August 1999, Minneapolis, IMA Workshop on Codes, Systems and Graphical Models
 October 1999, Seattle, Rainwater Seminar
 November 1999, Victoria, Dynamics Seminar
 April 2000, Seattle, Rainwater Seminar
 May 2000, Victoria, Northwest Dynamical Systems Conference
 October 2000 San Francisco, AMS meeting section on Geometric and symbolic dynamics
 December 2000, Santiago, Workshop on Dynamics and Randomness
 February 2001, Bozeman, Dynamics seminar
 January 2002, San Diego, symbolic dynamics session of AMS meeting
 June 2002, East Lansing, Michigan State University, dynamics seminar
 July 2002, CIRM, Luminy, France, Workshop on countable topological Markov chains: classification and recurrences,
 July 2003, Univ. of Warwick, Symposium on Geometric and Probabilistic Aspects of Dynamical Systems, series of 3 lectures
 October 2003, Midwest Dynamical Systems Conference (Indianapolis)
 June 2004, Max Planck Institute (Bonn)
 July 2004, Max Planck Institute (Bonn)
 September 2004, Wesleyan Dynamics seminar (Middletown CT), two talks
 September 2004, MSRI Recent Progress in Dynamics conference
 October 2004, Penn State/Maryland Dynamics conference (Penn State)
 December 2004, Dynamics and Randomness Conference, Santiago
 January 2005, V Escuela Internacional de Sistemas Dinamicos, Santiago
 February 2005, Dynamics seminar, Georgia Tech
 August 2005, Northwest Dynamics Symposium, Victoria
 November 2005, IUPUI Math. Dept. Colloquium, Indianapolis
 January 2006, Ecole Polytechnique, Seminaire Ergodique Geometrie
 November 2006, Colloquio de Sistemas Dinamicos, Universidad de Chile
 December 2006, School on Information and Randomness, Universidad de Chile

October 2007, Conference on Entropy of Hidden Markov Processes and Connections to Dynamical Systems, BIRS, Banff, Canada
 May 2008, Mathematics Colloquium, DePaul University
 May 2008, Rocky Mountain Dynamical Systems Conference, Park City, Utah
 June 2008, Copenhagen, Denmark, 8 hours of lectures
 August 2008, Northwest Dynamical Systems Symposium, Victoria
 December 2008, Information and Randomness Conference, Santiago, Chile
 February 2009, University of Connecticut, Storrs, Math Colloq.
 May 2009, Kansas State University, invited ADVANCE lecture
 February 2010, CIRM, Luminy, France, 3 hours of invited lecture, Multidimensional Subshifts and Tilings Conference
 August 2010, Dynamics Workshop, Pingree Park, Colorado
 September 2010, Warwick, England, Symposium on Ergodic Theory and Dynamical Systems
 December 2010, Pucon, Chile, Information and Randomness Conference
 February 2011, University of Houston, Department of Mathematics Colloquium
 June 2011, CIRM, Luminy, France, 2 hours of invited lecture, Beyond Uniform Hyperbolicity Conference
 August 2011, Fields Institute, Toronto, Workshop on Positivity
 November 2011, Howard University, Math Dept. Colloquium
 March 2012, Special Session “Tilings, substitutions and Bratteli-Vershik transformations” of Washington D.C. meeting of Amer. Math. Soc. (20 minutes)
 April 2012, Northwestern University, Dynamics Seminar
 June 2012, Universite Paris-Sud, Orsay, department colloquium
 October 2012, University of British Columbia, Vancouver, dept. colloquium
 October 2012, University of British Columbia, Vancouver, Marcus seminar (dynamics)
 October 2012, Penn State Dynamics Conference
 December 2012, IRAS (School on Information and Randomness), Puerto Varas, Chile
 April 2013 Carolina dynamics conference, Chapel Hill
 April 2013 BIRS workshop on Graph algebras
 June 2013 PIMS Workshop on Automata and Symbolic Dynamics
 June 2013 Grenoble School, Number Theory and Dynamics, 4 lectures
 October 2013 U. Copenhagen, Operator Theory Seminar
 October 2013 Center for Symmetry and Deformation
 November 2013 U. Copenhagen, Conference on Flow equivalence
 November 2013 Lund, Dept. Colloquium
 December 2013 Orsay, Groupe de Travail, Dynamical Systems seminar
 May 2014 U. Washington, Seattle, Rainwater Seminar
 July 2014 U. Victoria, Dynamics Seminar
 July 2014 Pingree Park Dynamics Conference
 July, August 2014 U. British Columbia, Marcus seminar (three times)
 January 2015 U. Kansas, Dept. Colloquium
 March 2015 U.S. Naval Academy, Dept. Colloquium
 March 2015 Morgan State, Dept. Colloquium
 May 2015 Operator algebras conference (Lafayette, Louisiana)
 June 2015 Rocky Mountain Dynamical Systems conference (Provo, Utah)
 January 2016 Mittag-Leffler Institute (Stockholm) conference
 October 2016 AMS Special Session on zero-dimensional dynamics (Denver, Col.)
 February/March 2017 Groups of dynamical origin (Mexico City)
 March 2017 U. Victoria Dynamics Seminar (Victoria, Canada)
 April 2017 Pacific Northwest Dynamics Day (Seattle)
 April 2018 Maryland-Penn State Dynamics Conference (College Park, Maryland)
 May 2018 Northwestern Dynamics Seminar (Evanston, IL)

f. Memberships in honorary or professional societies

American Mathematical Society
International Linear Algebra Society
Mathematics Association of America (through 2012)

3. TEACHING AND ADVISING

a. Courses taught

Fall 85
MATH 241 (Sophomore Calculus, approx. 30 students)
MATH 410 (Advanced Calculus, ap. 30)
Spring 86
MATH 410 (Advanced Calculus, ap. 25)
MATH 411 (Advanced Calculus, ap. 25)
Fall 86 MATH 220 (Calculus, large lecture)
Spring 87
MATH 643 (Ergodic Theory graduate course, ap. 6)
Fall 87
MATH 240 (Linear Algebra, large lecture)
Spring 88
MATH 417 (Fourier Series, ap. 8)
Fall 88
MATH 240 (Linear Algebra, large lecture)
MATH 730 (Topology, graduate course, ap. 11)
Spring 89
MATH 240 (Linear Algebra, large lecture)
MATH 417 (Fourier Series, ap. 8)
Fall 89
MATH 140 (Calculus, large lecture)
MATH 406 (Number Theory, ap. 25)
Spring 90
MATH 140 (Calculus, large lecture)
MATH 246 (Differential Equations, ap. 12)
Fall 90
MATH 140 (Calculus, large lecture)
MATH 406 (Number Theory, ap. 25)
Spring 91
MATH 140 (Calculus, large lecture)
MATH 463 (Complex Analysis, ap. 25)
Fall 91
MATH 220 (Calculus for nonscientists, large lecture)
MATH 642 (Measurable Dynamics, 14)
Fall 93
MATH 410
MATH 240 (large lecture)
Spring 94
MATH 140 (large lecture, Treisman-Wolpert workshops)
MATH 643 (Dynamics, ap. 6 + auditors)
Fall 94
MATH 141 (large lecture, Treisman-Wolpert Workshops)
MATH 630 (Real Analysis, 26 + auditors)
Spring 95
MATH 140 (large lecture, Treisman-Wolpert Workshops)

631 (Real Analysis)
 Fall 96
 MATH 141 (large lecture, Treisman-Wolpert Workshops)
 STAT 400 (Statistics, ap. 20)
 Spring 96
 MATH 648 (Topics in Symbolic Dynamics)
 STAT 100
 Fall 96
 MATH 410
 STAT 100
 Spring 97
 MATH 140
 STAT 100
 Summer 97
 STAT 400
 Fall 97
 STAT 100
 MATH 140H
 Spring 98
 MATH 241
 MATH 246
 Fall 98
 MATH 350
 Spring 99
 MATH 351
 STAT 400
 Fall 99 - Spring 2000
 Differential equations (undergrad) and graduate topics course (Seattle)
 Fall 2000
 STAT 400 (2 sections)
 Spring 2001
 MATH 141 (large lecture, close contact calculus)
 Stat 100
 Fall 2001
 Math 141 (large lecture)
 Spring 2002
 Math 141 (large lecture, close contact and webassign)
 Fall 2002
 Math 141 (large lecture)
 Spring 2003
 Math 141 (large lecture, close contact and webassign)
 Fall 2003
 Math 141H
 Stat 400
 Spring 2004
 Stat 400
 Summer 2004
 Stat 400
 Fall 2004
 Math 140H
 Math 414
 Spring 2005
 Math 475

Math 220
Summer 2005
Math 246
Fall 2005
Math 220
Math 642
Spring 2006
Math 461
Fall 2006
Graduate topics course (Universidad de Chile)
Fall 2007
Math 274 (History of Mathematics)
Fall 2008
Math 410 (Advanced Calculus)
Spring 2009
Math 274 (History of Mathematics)
Fall 2009
MATH 141 (Calculus II)
Spring 2010
STAT 401
Fall 2010
MATH 140H (Calculus I)
MATH 648E (Topics in Symbolic Dynamics)
Spring 2011
MATH 240 (Linear Algebra, large lecture)
MATH 405 (Linear Algebra, second course)
Fall 2011
MATH 240 (Linear Algebra, large lecture)
MATH 411 (Advanced Calculus II)
Spring 2012
MATH 240 (Linear Algebra, large lecture)
MATH 411 (Advanced Calculus II)
Fall 2012
MATH 240 (Linear Algebra, large lecture)
MATH 410 (Advanced Calculus I)
Spring 2013
MATH 240 (Linear Algebra, large lecture)
MATH 411 (Advanced Calculus II)
Fall 2014
MATH 130 (Calculus I for Life Sciences, large lecture)
MATH 463 (complex variables)
Spring 2015
MATH 130 (Calculus I for Life Sciences, large lecture)
MATH 416
Fall 2015
MATH 402
MATH 131 (Calculus II for Life Sciences, large lecture)
Spring 2016
MATH 131 (Calculus II for Life Sciences, large lecture)
MATH 410

b. Ph.D. Students (with degree date)

1. Danrun Huang (Spring 1992) (jointly advised with Seymour Goldberg)
2. Nicholas Ormes (Spring 1997)
3. Sam Lightwood (Spring 1998)
4. Inhyeop Yi (Spring 2000) (jointly advised with Jonathan Rosenberg)
5. Ricardo Gomez (Summer 2000)
6. Angela Desai (Spring 2006)
7. Andrew Dykstra (Spring 2007)
8. Nicholas Long (Spring 2008)
9. Kevin McGoff (Spring 2011)
10. Sompong Chuysurichay (Spring 2011)
11. Scott Schmieding (Spring 2016)

4. Service

a. Departmental

Organizer: Symbolic Dynamics Seminar (1987-8)
Special Year in Dynamics (1986-7):
- main organizer, Symbolic Dynamics Conference
- solicited and/or refereed several papers for Proceedings of Special Year
Policy Committee (1985-6)
Salary Committee (1988)
Mathnet Committee (1989-90)
Annual department party committee, Chair (1989)
Math 240 textbook review committee, Chair (1990)
EEEE Officer (Fall 1990-Summer 1992)
Department Ombudsman (Fall 1993-1994)
Chair, ODE/Dynamics Field Committee (Fall 93 - Spring 95)
CMPS APT Committee (Fall 94 - Spring 96)
Chair, Promotions Committee (Fall 96 - Spring 98)
Salary Committee (Spring 97)
Peer Review Committee (Fall 97 - Spring 98)
Chair, Math-Stat Majors Committee (Fall 97 - Spring 99)
Coauthor, VIGRE Proposals (97, 98)
Coorganizer, Dynamics Seminar (Fall85-Spring86, F87-Sp88, F98-Sp99, F00-Sp01,F03-Sp04, F04-Sp05, F05-Sp06, F11-Sp12, F12-Sp13, F14-Sp15)
Undergraduate advising (every semester since Fall 00 or sooner)
Chair, Math-Stat Majors Committee (Fall 00 - Spring 01)
Chair, Graduate Student Teaching Committee (Fall 00-Spring 01)
Departmental Self-study, Spring 01
Flagship Hiring Committee, Spring 01
Associate Chair for Undergraduate Studies, August 01 - August 03
MCPS Committee (exploring creation of a masters for middle school math), Spring 04
Salary Committee, Spring 04
Undergraduate VIGRE supervisor, Spring 04-Spring 06
Chair, ODE/Dynamics Field Committee, Fall 05-Spring 06
Chair, Brin Chair Selection Committee Fall 05-Spring 06
CMPS PCC Committee, Fall 05 - Spring 06
Associate Chair for Undergraduate Studies, July 07 - May 10
CMNS representative to University Senate, Fall 2014-Spring 2016

b. Professional

JOURNAL REFEREE for
American Mathematical Monthly,
Annals of Mathematics,
Annales de l'Institut Fourier,
Archiv der Mathematik,
Chaos,
Colloquium Mathematicum,
Communications on Pure and Applied Analysis,
Complex Systems,
Documenta Mathematica,
Duke Mathematical Journal,
Dynamical Systems,
Electronic Research Announcements of AMS,
Ergodic Theory and Dynamical Systems,
Forum Mathematicum,
Fundamenta Mathematicae,
Geometric and Functional Analysis,
Illinois Journal of Math.,
Indagationes Mathematicae,
Inventiones Mathematicae,
Israel Journal of Math.,
J. für Angewandte und Reine Mathematik (Crelle's Journal),
Journal of the American Mathematical Society,
Journal of Combinatorial Theory,
Journal of Modern Dynamics,
Journal d'Analyse,
Linear Algebra and Its Applications,
London Math. Society,
Monatshefte für Mathematik,
Nonlinearity,
Proceedings of the American Mathematical Society,
Real Analysis Exchange,
Rocky Mountain Journal of Mathematics,
Stochastics and Dynamics,
Transactions of the American Mathematical Society
Uniform Distribution Theory

GRANT/PROPOSAL REVIEWER

NSF, NSA, BIRS (Banff International Research Station, Canada) NSERC (Canada), Israel Science Foundation, CONICYT (Chile)

CONFERENCE ORGANIZATION

Co-organizer, Symbolic Dynamics and Coding Theory, Special Year Conference at College Park, December 1986
Co-organizer, Special Session on Measurable Dynamics, AMS Meeting at College Park April 1988
Co-organizer, Workshop on Measurable Dynamics, College Park, September 1989
Co-organizer, Low-Dimensional Dynamics Conference, College Park, April 1990
Chair, Organizing Committee for MSRI Symbolic Dynamics Workshop, (5 days) Nov. 1992
Co-organizer, Maryland-Penn State Regional Dynamics Conference, (4 days) College Park, March 1994
Co-organizer, Maryland-Penn State Regional Dynamics Conference, (4 days) and Symbolic Dynamics Workshop (1 day), College Park, March 1995

Co-organizer, Maryland-Penn State Regional Dynamics Conference, (4 days) and Symbolic Dynamics Workshop (1 1/2 days), College Park, March 1996
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, May 1997
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days) and Symbolic Dynamics Workshop (1 1/2 days), College Park, March 1998
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, March 2001
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, March 2002
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, March 2004
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, March 2005
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, March 2008
Co-organizer, Maryland-Penn State Regional Dynamics Conference (4 days), College Park, March 2010
Co-organizer, First Mathematical Conference of the Americas, Guanajuato, August 2013, Special Session in Symbolic Dynamics
Co-organizer, Maryland-Penn State Regional Dynamics Conference (3 days), College Park, April 2016

NSF PANELS

Fall 2007

Fall 2009

EXTERNAL REVIEWER

Bowie State University Department of Mathematics, Spring 2004

EDITORIAL BOARD

Ergodic Theory and Dynamical Systems, 2000 - .

EXECUTIVE EDITOR

Ergodic Theory and Dynamical Systems, 2009 - 2015 .

GUEST EDITOR

Acta Applicandae Mathematicae, Kim memorial volume, 2013

J. Modern Dynamics, Adler memorial volume (in progress), coeditor