

## CURRICULUM VITAE

Daniel J. Rudolph

Born October 3, 1949, in Sheridan Wyoming, US Citizen

### I. PERSONAL INFORMATION

#### EDUCATION

Institution	Degree	Date Awarded
Caltech	B.S.	1972
Stanford	M.S.	1973
Stanford	Ph.D.	1975
Thesis advisor: D.S. Ornstein		

#### EXPERIENCE IN HIGHER EDUCATION

Institution	Rank	Dates
Colorado State University	Yates Chair and Professor	2004–present
University of Maryland	Professor	1985-2004
University of Maryland	Associate Professor	1981-1985
Stanford University	Assistant Professor	1978-1981

#### Temporary positions

Pacific Inst. of Math. Sci.	Distinguished Prof.	Oct.-Nov., '04
Inst. for Adv. St. Hebrew U. of Jerusalem	Wilson Fellow	Sept.-June, '96-'97
Univ. F. Rabelais, Tours	Visiting Professor	June-July, '93
LMD, Marseille	Visiting Professor	Jan.-June, '93
UNC Chapel Hill	Visiting Professor	Jan.-June, '91
N. Copernicus U.	Visiting Professor	July, '89
Math. Inst., U. of Warwick	Visiting Professor	May-June, '89
U. of Paris VI	Visiting Professor	Sept.-Mar. '88-'89
MSRI	Fellow	Aug.-Dec., '83
Inst. for Adv. St. Hebrew U. of Jerusalem	Fellow	Aug.-June, '75-'76
Miller Inst., UC Berkeley	Fellow	1976-'78

## II. RESEARCH, SCHOLARLY AND CREATIVE ACTIVITY

### PUBLICATIONS

#### RESEARCH ARTICLES

##### A. Articles published, or accepted for publication, in research journals.

1. **Two Nonisomorphic  $K$ -automorphisms with Isomorphic Squares**, Israel J. of Math., Vol. 23 Nos. 3-4, 1976, 274-287.
2. with G. Schwarz. **On attaining  $d$ -bar**, Israel J. of Math., Vol. 24, Nos. 3-4, 1976, 185-189.
3. **A Two-Valued Step Coding for Ergodic Flows**, Math. Z. 150, 1976, 201-220.
4. with D. S. Ornstein and B. Weiss, **Equivalence of Measure Preserving Transformations**, Memoirs of the AMS no. 262 114 pps.
5. with G. Schwarz, **The Limits in  $d$ -bar of Multistep Markov Chains**, Israel J. of Math., Vol. 28, Nos. 1-2, 1977, 103-109.
6. **Two Nonisomorphic  $K$ -automorphisms all of whose Powers Beyond One are Isomorphic**, Israel J. of Math., Vol. 27 Nos. 3-4, 1977, 277-298.
7. **The Second Centralizer of a Bernoulli Shift is just its Powers**, Israel J. of Math., Vol. 29, Nos. 203, 1978, 167-178.
8. **If a Two-Point Extension of a Bernoulli Shift has an Ergodic Square, then it is Bernoulli**, Israel J. of Math., Vol. 30. Nos. 1-2, 1978, 159-180.
9. **An Isomorphism Theory for Bernoulli  $\mathbb{Z}$ -skew-Compact Group Actions**, Adv. in Math., Vol. 47, No. 3, 1983, 241-257.
10. **If a Finite Extension of a Bernoulli Shift has no Finite Rotation Factors, it is Bernoulli**, Israel J. of Math., Vol. 30, Nos. 3, 1978, 193-206.
11. **Counting the Relatively Finite Factors of a Bernoulli Shift**, Israel J. of Math., Vol. 30, nos. 3, 1978, 255-263.
12. **Classifying the Isometric Extensions of a Bernoulli Shift**, J. de Analyse, Vol. 34, 1978, 36-59.
13. with J. Feldman and C. Moore, **Affine Extensions of a Bernoulli Shift**, Trans. AMS., Vol. 257, no. 1, 1980, 171-191.

14. **Smooth Orbit Equivalence of Ergodic  $\mathbb{Z}^d$  actions**,  $d \geq 2$ , Trans. AMS., Vol. 253, 291-302.
15. **An Example of a Measure Preserving Map with Minimal Self- Joinings and Applications**, J. de Analyse, Vol. 35, 1979, 97- 121.
16. with J. M. Steele, **Sizes of Order-Statistical Events**, Annals of Probability, Vol. 8, No. 6, 1980, 1079-1084.
17. **A Mixing Markov Chain with Exponentially Decaying Return Times is Finitarily Bernoulli**, J. of Erg. Th. and Dyn. Sys. Vol. 2, 1982, 85-97.
18. **Ergodic Behavior of Sullivan's Geometric Measure on a Geometrically Finite Hyperbolic Manifold**, J. of Erg. Th. and Dyn. Sys. Vol. 2, 1982, 491-512.
19. with A. Del Junco, **Kakutani Equivalence of Ergodic  $\mathbb{Z}^n$  Actions**, J. of Erg. Th. and Dyn. Sys., Vol. 4, 1984, 89-104.
20. with M. Rahe, **Loose Bernoullicity is Preserved Under Exponentiation by Integrable Functions**, J. of Erg. Th. and Dyn. Sys. Vol. 7, part 2, 1987, 263-266.
21. **Restricted Orbit Equivalence**, Memoirs of the AMS. Vol. 54, No. 323, Mar. 1985, 150 pps.
22. with S. Glasner, **Uncountably Many Topological Models for Ergodic Transformations**, J. of Erg. Th. and Dyn. Sys., Vol. 4, 1984, 233-236.
23.  **$K$ -fold Mixing lifts to Weakly Mixing Isometric Extensions**, J. of Erg. Th. and Dyn. Sys., Vol. 5, 1985, 445-447.
24. with A. Del Junco, **On Ergodic Actions whose Self-Joinings are Graphs**, J. of Erg. Th. and Dyn. Sys. Vol. 7, 1987, 531-557.
25.  **$\mathbb{Z}^n$  and  $\mathbb{R}^n$  Cocycle Extensions and Complementary Algebras**, J. of Erg. Th. and Dyn. Sys. Vol. 6, 1986, 583-599.
26. with A. del Junco, **A Rank One, Rigid, Simple, Prime Map**, J. of Erg. Th. and Dyn. Sys. Vol. 7, 1987, 229-247.
27. **Asymptotically Brownian Skew Products give Non-loosely Bernoulli  $K$ -Automorphisms**, Invent. Math., Vol. 91, 1988, 105-128.
28. With M. Boyle and D. Lind, **The Automorphism Group of a Shift of Finite Type**, Trans. of AMS. Vol. 306, no. 1, 1988, 71- 114.

29.  $\times 2$  and  $\times 3$  **Invariant Measures and Entropy**, Erg. Th. and Dyn. Sys. Vol. 10, 1990, 395-406.
30. with C. Silva, **Minimal Self-Joinings for Non-Singular Transformations**, Erg. Th. and Dyn Sys. Vol. 9, part 4, 1989, 759-800.
31. with A. Fieldsteel, **An ergodic transformation with trivial Kakutani centralizer**, Erg. Th. and Dyn. Sys. Vol. 12, part 3, 1992, 459-478.
32. with A. S. A. Johnson, **Commuting Endomorphisms of the Circle**, Erg. Th. and Dyn. Sys. Vol. 12, part 4, 1992, 743-747.
33. **A Joinings Proof of Bourgain's Return Time Theorem**, Erg. Th. and Dyn. Sys. Vol. 14, 1994, 197-203.
34. with J. Kwiatkowski and M. Lemańczyk **Weak isomorphism of measure-preserving diffeomorphisms**, Isr. Jour. of Math., 80, 1992, 33-64.
35. with A. Ivanik and M. Lemańczyk, **Absolutely continuous cocycles over irrational rotations**, Isr. Jour. of Math., 83, 1993, 73-95.
36. with J. Kwiatkowski and M. Lemańczyk, **A class of real cocycles having an analytic coboundary modification**, Isr. Jour. of Math., 87, 1994, 337-360.
37. with M. Lacey, K. Petersen and M. Wierdl, **Random ergodic theorems with universally representative sequences**, Annales of the Inst. H. Poincaré, Vol. 30, No. 3, 1994, 353-375.
38. with A. Johnson, **Convergence under  $\times q$  of  $\times p$  invariant measures on the circle**, Adv. in Math., Vol. 115, no.1, Sept. 15, 1995, 117-140.
39. appendix to **Metrics and entropy for non-compact spaces** by M. Handel and B. Kitchens, Isr. Journal of Math.,(91) no.'s 1-3, 1995, 253-271.
40. with A. Fieldsteel and A. del Junco, **Alpha-equivalence: a refinement of Kakutani Equivalence**, Erg. Th. & Dyn. Sys., Vol. 14 part 1, 1994, 69-102.
41. with F. Blanchard, B. Host, A. Maass, and S. Martínez **Entropy pairs for a measure**, Erg. Th. & Dyn. Sys., Vol. 15, 1995, 621-632.
42. with I. Assani and E. Lesigne **Wiener-Wintner return times ergodic theorem**, Isr. J. of Math., Vol. 92, 1995, 375-395.

43. **Eigenfunctions of  $T \times S$  and the Conze-Lesigne algebra**, Ergodic Theory and its Connections with Harmonic Analysis, eds. K. Petersen and I. Salama, London Math. Soc. Lecture note series, (205), 1995, 369–432.
44. with K. Schmidt, **Almost block independence and Bernoullicity of  $\mathbb{Z}^d$  actions by automorphisms of compact Abelian groups**, Inv. Math., 120 (1995), no. 3, 455–488.
45. with A. Nogueira, **Topological weak-mixing of interval exchange maps**, Erg. Th. & Dyn. Sys., Vol. 17, 1997, 1183–1209.
46. with J. Kammeyer **Restricted orbit equivalence for ergodic  $\mathbb{Z}^d$ -actions**, Erg. Th. and Dyn. Sys., Vol. 17, 1997, 1083–1129.
47. with A. del Junco, **Residual behavior of induced maps**, Isr. J. of Math., 93, 1996, 387–398.
48. **Fully generic sequences and a multiple-term return-times theorem**, Inv. Math., Vol. 131, 1998, 199–228.
49. with A. del Junco, G. Goodson, and M. Lemańczyk, **Ergodic transformations conjugate to their inverses by involutions**, Erg. Th. and Dyn. Sys., 16 (1996), 97–124.
50. with J. Feldman **Standardness of sequences of  $\sigma$ -fields given by certain endomorphisms**. Fund. Math., 157, (1998), 175–189.
51. with B. Weiss **Entropy and Mixing for Amenable Group Actions**, Ann. of Math. (2) 151 (2000), no. 3, 1119–1150.
52. with D. Hecklen and C. Hoffman **Entropy and Dyadic Equivalence of Random Walks on a Random Scenery**, Advances in Mathematics, Vol. 156, No. 2, Dec 2000, pp. 157-179
53. with C. Hoffman **Uniform Endomorphisms which are isomorphic to a Bernoulli shift**, Annals of Mathematics, 156 (2002), 79–101.
54. with C. Hoffman **A dyadic endomorphism which is Bernoulli but not standard**, Isr. J. of Math., 130 (2002), pp. 365–379.
55. **An entropy preserving Dye’s theorem for ergodic actions**, Journal d’Analyse Math., to appear.
56. **Pointwise and  $L^1$  mixing relative to a sub sigma algebra**, Ill. J. of Math., vol. 48 (2) pp. 505–517.

## B. Articles in Proceedings of Symposia, Conferences, etc.

1. **A Characterization of those Processes Finitarily Isomorphic to a Bernoulli Shift**, Proceedings of the Special Year in Ergodic Theory and Dynamical Systems, U. of Maryland, 1979-80, 1-64.
2. **Inner and Barely Linear Time Changes of Ergodic  $\mathbb{R}^k$  Actions**, Conf. in Mod. Anal. and Prob., Contemp. Math (Kakutani conf.) Vol. 26, 1983, 351-372.
3. with V. Bergelson, **Weakly Mixing Actions of  $F^\infty$  have Infinite Subgroup Actions Which are Bernoulli**, Proceedings of the Special Year in Dynamical Systems, University of Maryland, 1986-87, 7-22.
4. **Rectangular Tilings of  $\mathbb{R}^n$  and Free  $\mathbb{R}^n$ -actions**, Proceedings of the Special Year in Dynamical Systems, University of Maryland, 1986-87, 689-705.
5. **Markov Tilings of  $\mathbb{R}^n$  and Representations of  $\mathbb{R}^n$ -actions**, Contemp. Math (Stone conf.) Vol. 94, 271-290.
6. **Residuality and orbit equivalence**, in *Topological dynamics and Applications* Contemp. Math (Ellis Volume), Vol. 215, 1998, 243–253.
7. with C.-H. Lin **Sections for semiflows and Kakutani shift-equivalence** Special volume published by Cambridge U. Press, to appear.

## C. Preprints and Articles submitted to Scholarly Journals

1. with A. Dooley **non-uniqueness in G-measures**, preprint.
2. with C. Hoffman **If the  $[T, id]$  automorphism is Bernoulli then the  $[T, id]$  endomorphism is standard**, Studia Mathematica, to appear.
3. with A. Danilenko **Relative entropy theory for infinite amenable actions**, preprint.
4. with A.H. Dooley, V. Ya. Golodets and S.D. Sinel'shchikov **An uncountable family of completely positive entropy actions for countable discrete Abelian groups**, preprint submitted to J. of Erg. Th. and Dyn. Sys.

## BOOKS

1. **Fundamentals of Measurable Dynamics, Ergodic Theory on Lebesgue Spaces**, 1990, Oxford University Press.
2. with J. Kammeyer **Restricted orbit equivalence for actions of discrete amenable groups**, Cambridge Tracts in Mathematics, Number 146, ISBN: 0521807956.

## GRANTS, CONTRACTS, AWARDS AND PRIZES

E. T. Bell UG Research Prize,	Caltech,	1972
Sloan Fellow		1981-82
NSF summer Contracts		1976-2002 and 2004-present
Distinguished Scholar-Teacher	Univ. of Maryland	1987-88
CNRS Grant	Univ. of Paris VI	Spring 1989
Wilson Fellow of the IAS	Hebrew U. of Jerusalem	1996-97
Co-PI, Maryland VIGRE Program		2003-2008
PI, Maryland STAND GRP Grant		2003-2005
PI, NSA grant in support of Math SPIRAL,	Univ. of Maryland.	
Co-PI CRDF grant		2002-2005

## INVITED LECTURES

1. Rennes Conference in Dynamical Systems, U. of Rennes, France Aug. 1975.
2. Lecture series on Nonequivalence, Inst. for Adv. Studies, Hebrew U. of Jerusalem, spring, 1976.
3. AMS Summer session in Ergodic Theory and Dyn. Syst., U. of New Hampshire, Durham, NH, June 1982.
4. Special Session in Ergodic Theory and Dyn. Syst., Winter meeting of the AMS, Cincinnati, Jan. 1982.
5. Special Session in Ergodic Theory and Dyn. Syst., Summer meeting of the AMS, Toronto, Aug. 1982.
6. Principle Speaker, Two Week Siminar in Ergodic Theory, SUNY Albany, Mar. 1983 (six lectures).
7. Chern Colloquium, Math Sci. Research Inst. at U. C. Berkeley, Nov. 1983.
8. Geometry and Dynamics Seminar, Courant Institute, Jan. 1986.
9. Special Session in Ergodic Theory, Winter meeting of the Canadian Mathematical Society, Ottawa, Dec. 1986.
10. Invited address, "Love, Money and Combinatorics," Seventh Annual U. of Md. High School Mathematics Competition Awards Ceremony, 1986.
11. Dorothy M. Stone Retirement Conference, Univ. of Rochester, Aug. 1987.

12. Departmental Colloquium, Rice University, Oct. 1987.
13. Departmental Colloquium, UNC, Chapel Hill, Nov. 1987.
14. Public lecture "From Calculus to Chaos; the Mathematics of Motion and Change" Distinguished Scholar-Teacher Series, Univ. of Maryland, Apr. 1988.
15. Colloquium de Mathematiques Des Universites Parisiennes, University of Paris VI-VII, Feb. 1989.
16. Univ. of Wroclaw Conference in Erg. Th. and Dyn. Sys., Poland, June, 1989.
17. Conference on Nonsingular Dynamics, Universite de Paris Nord, June, 1989.
18. Journees Arithmetique, Luminy, July, 1989.
19. Conference in Topological and Measurable Dynamics, IMA, Univ. of Minn., Jan. 1990.
20. Seminaire Analyse Harmonique et Theorie Ergodique, Univ. de Paris Nord, three lectures on interval exchanges, June 7, 11, and 18, 1990.
21. Departmental Colloquium, Univ. of Pennsylvania, Sept. 12, 1990.
22. Dynamics Seminar and Undergraduate Colloquium, Williams College, Sept. 24, 1990.
23. Special Session in Ergodic Theory, Meeting of the AMS at U. Mass. Amherst, 20 minute talk, Oct. 20, 1990.
24. Journee Arithmetique, Luminy, June, 1991.
25. Special Session in Ergodic Theory, Meeting of the AMS at U. of N.D. Fargo, N.D., 20 minute talk, Oct., 1991.
26. Workshop on Ergodic Theory of Amenable Group actions, MSRI, U.C. Berkeley, Feb. 1991.
27. Dynamics seminar, Univ. of Colorado, Boulder, April, 1992.
28. Math. Dept. Colloquium, Northwestern, Jan. 1993.
29. Dynamical systems seminar, Univ. of Paris VI, Feb. 1993
30. Harmonic analysis seminar, Univ. of Lyon, Feb. 1993.
31. Dynamics Seminar, Lab. de Math. Discrete, Luminy, May, 1993
32. Harmonic Analysis Seminar, Univ. d'Aix-Marseille, June, 1993

33. Invited Lectures (2), Univ. de F. Rabelais, Tours, July, 1993.
34. Maryland-Penn State dynamics conference, PSU, Nov. 1993.
35. Journee Tourangelles de Mathematique et Physique Mathematique, June 22-23, 1994, invited lecture.
36. Invited lecture series (3) "A tour in 3 parts of Bernoulli-city", Special Year in Dynamics, Math. Inst., Univ. of Warwick, June, 1994.
37. Maryland-Penn State dynamics conference, PSU, Nov. 1994.
38. Dept. Colloquium, Feb. 10, 1995, Univ. of Texas at Austin.
39. Invited lectures (3, one was dept. Colloquium) "The multiple-term return times theorem" as Visiting Scholar, Mar. 20-24, North Dakota State Univ.
40. Dept. Colloquium, June 13, 1995, University of New South Wales.
41. Dept. Colloquium, June 23, 1995, University of Sydney, Australia.
42. Dept. Colloquium, City College of NY, Mar. 8, 1996.
43. Colloquium of the Institute for Advanced Studies, Hebrew Univ. of Jerusalem, Sept. 23, 1996.
44. Dept. Colloquium, Hebrew Univ. of the Negev, Beer Sheva, Nov. 12, 1996.
45. Schrödinger Institute, three one hour lectures, Jan. 14, 16, and 20 1997. "Restricted Orbit Equivalence for amenable group actions."
46. Hour lecture, Conference on Modern Ergodic Theorems, Technion, Haifa, Mar. 16-21, 1997.
47. Hour lecture, Dynamics seminar, Math. Inst, Hebrew U., June 1998.
48. Hour invited, Penn State Dynamics Workshop, Oct. 10, 1998.
49. Hour invited, Penn State Dynamics Workshop, Oct. 23, 1999.
50. Hour lecture, Ergodic Theory Workshop, U. of Memphis, Jan. 29, 2000.
51. Hour lecture, Northwest Dynamics Symposium, U. of Victoria, May 6, 2000.
52. Hour lecture, Conference on Topics in Ergodic Theory Probability, and Analysis in honor of Jacob Feldman, Penn State, April 21, 2001.

53. Hour lecture, Conference on Topics in Ergodic Theory and Topological Dynamics in honor of Jan Kwiatkowski, Math Institute, Univ. N. Copernicus, Torun Poland, Jan. 18, 2002.
54. 45 minute invited lecture, International Congress of Mathematicians, Beijing, August 2002.
55. Hour lecture, Departmental Colloquium, Univ. of Maryland, Oct. 25, 2002.
56. Hour lecture, Departmental Colloquium, Univ. of Memphis, Nov. 20, 2002.
57. Hour seminar lecture, Stanford University, Jan. 24, 2003.
58. Hour lecture, Departmental Colloquium, Morehouse College, Feb. 27, 2003.
59. Colloquium, Courant Institute, Mar. 8, 2004.
60. 70th Birthday and Retirement Celebration for D.S. Ornstein, July 21, 2004.
61. PIMs Distinguished Professor Lectures, U. of Victoria, Oct. 25-27-28, 2004.
62. Departmental Colloquium, U. of British Columbia, Oct. 29, 2004.
63. PIMs Distinguished Professor Lectures, U. of Washington, Nov. 9-10, 2004.

### III. TEACHING AND ADVISING

#### COURSES TAUGHT IN THE LAST TEN YEARS

Fall '93	math 140H (honors calculus)
Spring '94	math 141H (honors calculus)
Fall '94	math 140 (large lecture calculus)
Spring '95	math 141 (large lecture calculus)
	math 241H (3rd semester honors calculus)
Fall '95	math 140 (large lecture calculus)
	math 648C ( )
Spring '96	math 141 (large lecture calculus)
Fall '96	Sabbatical leave
Spring '97	Sabbatical leave
Fall '97	math 140 (large lecture calculus)
	math410 (advanced calculus)
Spring '98	math 141 (large lecture calculus)
Fall '98	math 350 (honors UG analysis)
Spring '99	Teaching relief as Graduate Chair

Fall '99        math 220 (large lecture, business calculus)  
Spring '00     math 642 (graduate intro. to analysis)  
2001-2002 Acting Chair, no teaching  
2002-2003 Graduate Research Board support, no teaching  
Fall '03        Math 246 (ODE's with Matlab)  
                  Math 642 (graduate intro. to dynamics)  
Spring '04     Math 643 (2nd semester grad. intro. to dynamics)  
Fall '04 Paid Leave, CSU  
Spring '05     M617 (graduate intro. to analysis)

## THESES DIRECTED

- J. Kammeyer                      Phd                      June '87  
**Classifying the two point extensions of Bernoulli  $\mathbb{Z}$  actions**
- A. Johnson                      Phd                      June '90  
**Measures on the circle invariant under a non-lacunary subsemigroup of the integers**
- W. Bulatek                      Phd                      June '92  
**Smooth, weakly mixing, weakly isomorphic but not isomorphic flows**
- A. Sahin                      Phd                      January '95  
**Tiling representations of  $\mathbb{R}^k$  actions and alpha-equivalence in two dimensions**
- D. Heicklen                      Phd                      January '98  
**Decreasing sequences of  $\sigma$ -algebras in ergodic theory**
- F. Newberger                      Phd                      June '98  
**The ergodic theory of the Bowen-Margulis measure**
- J. Matteson                      M.Sc.                      August '01  
**The dynamics of twist maps and trimming operators**
- K. Ball                      Phd                      June '02  
**Entropy and sigma-algebra equivalence of random walks on random sceneries**
- C.-H. Lin                      Phd                      June '02  
**Semiconjugacy and Kakutani equivalence for dyadic endomorphisms**

## IV. SERVICE

### SERVICE TO THE UNIVERSITY of MARYLAND

1. Francis Scott Key Scholarship selection committee, Sp. '90
2. "Committee for the First Two years" Fall '93–Spring '95
3. Graduate Council committee on student affairs, Fall '93–Spring '95.
4. Graduate Council, Fall '99–Spring '02.
5. Dean's Graduate Education Task Force, 1999-2000.
6. Chair, Astronomy chair search committee, April–May 2002.
7. Graduate Research Board, '03–'04.

### SERVICE TO THE DEPARTMENT OTHER THAN TEACHING

1. Salary Committee, Spring 1984
2. Non-MPSE Advisory Committee, Fall 1984

3. Chairman, organizing committee, Special Year in Dynamical Systems, 1986-87
4. Chairman, ODE/Synamical Systems Field Committee, 1985-88
5. Policy Committee, 1989-90
6. CMPS Service Committee, 1989-90.
7. Chairman, Tenure Committee, Fall '91 thru Fall '92
8. Hiring Committee, 1991-92
9. Undergraduate math major advisor, 1991-92
10. Graduate Financial Aid committee, Spring '94 and Spring '95
11. Dean's Math Chair search committee, Dec. '95-Mar. '96.
12. Policy Committee, 1997-98.
13. Associate Chair for Graduate Studies, June 1998–June 2001.
14. Acting Chair, July 2001–June 2002.
15. Graduate Minicourse Series organizer '02–'03.
16. Academic Director, Math STAND Program, June 2002–present.
17. Director, Maryland VIGRE Program, March 2003–August 2004.

### **SERVICE TO THE MATHEMATICAL COMMUNITY**

1. NSF Reviewer, most recently, 2000.
2. Editorial Board, Ergodic theory and Dynamical Systems, 1987–1999
3. Editorial Committee in charge of modern analysis, Trans. of the AMS, 1994–1998.
4. Editorial Committee, Ergodic theory and Dynamical Systems, 2000–present
5. Referee for numerous journals.