

Curriculum Vitae for Mark Pollicott

December 6, 2009

1 Professional history

DATE OF BIRTH: 24 September 1959

PLACE OF BIRTH: Nottingham, England

NATIONALITY: British

UNIVERSITY EDUCATION:

B.Sc. (First Class, Mathematics and Physics), Warwick University, 1981

M.Sc. (Distinction, Mathematics), Warwick University, 1982

Ph.D. (Mathematics), Warwick University, 1984.

PERMANENT POSITIONS:

“New Blood” lecturer, Edinburgh University, 1984-1988

Investigador Auxiliar in I.N.I.C., Porto University (Portugal), 1988-92

Lecturer, Warwick University, 1992-95

Reader, Warwick University, 1995

Fielden Professor of Pure Mathematics, Manchester University 1996 - 2005

Professor, Warwick University, 2005 -

VISITING POSITIONS AND FELLOWSHIPS:

Visiting Member, I.H.E.S. (Bures s/Yvette), 1984-85

Visiting Member, I.A.S. (Princeton), 1987-88

Visiting Member, M.S.R.I. (Berkeley), Apr.-Aug. 1988

Assoc. Prof., CalTech, Apr.-June 1990

C.N.R.S. researcher (Institut Fourier), Feb.-Mar., 1992

Royal Society University Research Fellow, 1992-97

Leverhulme Trust Senior Research Fellow, 1998-99 and 2007-08

EU-Marie Curie Professorship, 2005

EDITORIAL DUTIES:

Executive Editor, *Ergodic Theory and Dynamical Systems*, 1994-97 and 2005 - (Editorial board, 1997-2005)

Editor, *Discrete and Continuous Dynamical Systems* 1995-2007

Editor, “Ergodic Theory of Z^d -actions”, (with K. Schmidt), *L.M.S. Lecture Notes* vol. 228, C.U.P., 1996

Editor, “Parry Memorial Volume”, (with P. Walters), *Ergodic Theory and Dynamical Systems*, vol. 28 (2) 2008

2 Publications

ARTICLES

1. An analogue of the prime number theorem for closed orbits of Axiom A flows (with W. Parry), *Annals of Mathematics*, 118 (1983) 573-591
2. A complex Ruelle-Perron-Frobenius theorem and two counterexamples, *Ergodic Theory and Dynamical Systems*, 4 (1984) 135-146 On the rate of mixing of Axiom A flows, *Inventiones Mathematicae*, 81 (1985) 413-426
3. Asymptotic distribution of closed geodesics, *Israel Journal of Mathematics*, 52 (1985) 209-224
4. On the rate of mixing of Axiom A flows, *Inventiones Mathematicae*, 81 (1985) 413-426
5. The Chebotarov theorem for Galois coverings of Axiom A flows (with W. Parry), *Ergodic Theory and Dynamical Systems*, 6 (1986)
6. Meromorphic extensions of generalised zeta functions, *Inventiones Mathematicae*, 85 (1986) 147-164
7. A note on the uniform distribution of primes and closed orbits, *Israel Journal of Mathematics*, 55 (1986) 199-212
8. Distributions of closed geodesics on the modular surface and quadratic irrationals, *Bulletin Societe Mathematique de France*, 14 (1986) 431-446
9. Linking numbers for hyperbolic flows, *Journal of the London Mathematical Society*, 34 (1986) 185-192
10. Symbolic dynamics for Smale flows, *American Journal of Mathematics*, 109 (1987) 183-200
11. Margulis distributions for Anosov flows, *Communications in Mathematical Physics*, 113 (1987) 137-154
12. C^r rigidity theorems for hyperbolic flows, *Israel Journal of Mathematics*, 61 (1988) 14-28
13. Analytic extensions of the zeta function for surfaces of variable negative curvature, *Journal of Differential Geometry*, 29 (1989) 699-709
14. A thermodynamic approach to locally symmetric manifolds of higher rank, *Portugalia Mathematicae*, 46 (1989) 283-304
15. Differentiability and analyticity of topological entropy for Anosov and geodesic flows (with A. Katok, G. Knieper and H. Weiss), *Inventiones Mathematicae*, 98 (1989) 581-597
16. Differentiability and analyticity of topological entropy for Anosov and geodesic flows (with A. Katok, G. Knieper and H. Weiss), *Bulletin of the American Mathematical Society*, 22 (1990) 285-293
17. C^k - rigidity for hyperbolic flows II, *Israel Journal of Mathematics*, 69 (1990) 351-360.
18. Error terms in "Prime Orbit Theorems" for locally constant suspended flows, *Quarterly Journal of Mathematics*, 41 (1990) 313-323.
19. The differential zeta-function for Axiom A attractors, *Annals of Mathematics*, 131 (1990) 331-354
20. Kleinian groups, Laplacian on forms and currents at infinity, *Proceedings of the American Mathematical Society*, 110 (1990) 269-279
21. Some applications of thermodynamic formalism to manifolds of constant negative curvature, *Advances in Mathematics*, 85 (1991) 161-192
22. A note on the Artuso-Aurell-Cvitanovic approach to the Feigenbaum tangent operator, *Journal of Statistical Physics*, 62 (1991) 257-267

23. Homology and closed geodesics in a compact negatively curved surface, *American Journal of Mathematics*, 113 (1991) 379-385
24. Zeta functions and analyticity of metric entropy for Anosov systems *Israel Journal of Mathematics*, 76 (1991) 257-264
25. Agmon's tauberian theorem and an analogue of Merten's theorem, *Proceedings of the American Mathematical Society*, 114 (1992) 1105-1105
26. Rotation sets for homeomorphisms and homology, *Transactions of the American Mathematical Society*, 331 (1992) 881-894
27. Exponential Mixing for the geodesic flow on hyperbolic three manifolds, *Journal of Statistical Physics* 67 (1992) 667-673
28. A note on asymptotics of perturbed expanding maps, *Portugalia Mathematicae*, 51 (1994)395-404
29. Rates of recurrence for Z^q and R^q extensions of subshifts of finite type (with R. Sharp), *Journal London Mathematical Soc.* 49 (1994) 401-416
30. Factorisation of the Lefschetz zeta functions and twisted periodic orbits, *Mathematische Zeitschrift* 217 (1994) 109-120
31. Derivatives of topological entropy for Anosov and geodesic flows, *Journal of Differential Geometry*, 39 (1994) 457-489
32. The Picard group, closed geodesics and zeta functions, *Transactions of the American Mathematical Society*, 344 (1994) 857-872
33. Orbit counting for some discrete groups acting on simply connected manifolds with neagative curvature (with R. Sharp), *Inventiones Mathematicae*, 117 (1994) 275-302
34. A new proof of a theorem of Margulis on geodesic arcs on negatively curved manifolds, *American Journal of Mathematics*, 117 (1995) 289-305
35. The dimensions of some self affine limit sets in the plane (with H. Weiss), *Journal of Statistical Physics*, 77 (1994) 841-866
36. The Hausdorff dimension of λ -expansions with deleted digits (with K. Simon), *Transactions of the American Mathematical Society*, 347 (1995) 967 - 983
37. One dimensional maps via complex analysis in several variables, *Israel Journal of Mathematics*, 91 (1995) 317-339
38. Large deviations, Gibbs measures, and closed orbits for hyperbolic flows, *Mathematische Zeitschrift*, 220 (1995) 219-230
39. Distribution of closed geodesics for manifolds of non-positive curvature, *Discrete and Continuous Dynamical Systems* 2 (1996) 153-161
40. Large deviations and the distribution of pre-images of rational maps (with R. Sharp), *Communications in Mathematical Physics* 181 (1996) 733 - 739
41. Growth series for the commutator subgroup (with R. Sharp), *Proceedings of the American Mathematical Society* 124 (1996) 1329-1335
42. Growth of periodic points and rotation vectors on surfaces (with R. Sharp), *Topology* 36 (1997) 765-774
43. The circle problem for co-compact surfaces of variable negative curvature (with R. Sharp), *Monatschifte Mathematica* 123 (1997) 61-70

-
44. A remarkable formula for the determinant of the Laplacian (with A.C. Rocha) *Inventiones Mathematicae*, 130 (1997) 399-414
 45. Poincaré series and zeta functions for surface group actions on R -trees (with R. Sharp), *Mathematische Zeitschrift*, 226 (1997) 335-347
 46. The Livsic cocycle equation for compact Lie group extensions of hyperbolic systems (with W. Parry) *Journal of the London Mathematical Society*, 56 (1997) 405-416
 47. Asymptotic auto-correlation for closed geodesics *Communications in Mathematical Physics*, 187 (1997) 341 - 355
 48. Generalized equilibrium states and behavior of average operators (with A. Fan) CRAS 327, Serie I (1998) 547-552
 49. Exponential error terms for growth functions on negatively curved surfaces, (with R. Sharp) *American Journal of Mathematics*, 120 (1998) 1019-1042
 50. An entropy for Z^2 -actions with finite entropy generators (with W. Geller), *Fundamenta Mathematica*, 157 (1998) 209-220
 51. Large Deviations for maps with indifferent fixed points (with R. Sharp and M. Yuri) *Nonlinearity*, 11 (1998), no. 4, 1173-1184
 52. Comparison theorems in hyperbolic geometry (with R. Sharp), *Transactions of the American Mathematical Society* 350 (1998) 473-499.
 53. Multifractal analysis for the continued fraction Manneville-Pomeau transformations and applications to diophantine approximation (with H. Weiss), *Communications in Mathematical Physics* 207 (1999) 145-171
 54. Measurable cocycle rigidity for some noncompact groups (with M. Nicol), *Bull. London Mathematical Society* 31 (1999), no. 5, 592-600.
 55. Closed orbits and homology for C^2 -flows, *Discrete Contin. Dynam. Systems* 5 (1999) 529-534
 56. On the rate of mixing of Axiom A attracting flows and a conjecture of Ruelle, *Ergodic Theory and Dynamical Systems* 19 (1999) 535-548.
 57. Regularity of solutions to the measurable Livsic equation (with M. Yuri), *Transactions of the American Mathematical Society*, 351 (1999), 559-568.
 58. Ergodic properties of the Bolyai-Rnyi expansion (with O. Jenkinson) *Indag. Math.* 11 (2000) 399-418.
 59. Computing invariant densities and metric entropy (with O. Jenkinson) *Comm. Math. Phys.* 211 (2000) 687-703.
 60. Non-homogeneous equilibrium states and convergence speeds of averaging operators (with Ai Fan), *Math. Proc. Cambridge Philos. Soc.* 129 (2000) 99-115.
 61. \mathbf{Z}^d -covers of horosphere foliations, *Discrete Contin. Dynam. Systems* 6 (2000) 147-154.
 62. Rates of mixing for potentials of summable variation, *Transactions of the American Mathematical Society* 352 (2000) no. 2, 843-853.
 63. Livsic theorems for connected Lie groups (with C. Walkden), *Trans. Amer. Math. Soc.* 353 (2001) 2879-2895
 64. Error terms for closed orbits of hyperbolic flows (with R. Sharp), *Ergod. Th. and Dynam. Sys.*, 21 (2001) 545-562
-

-
65. Linear actions of free groups (with R. Sharp), *Ann. Inst. Fourier* (Grenoble), 51 (2001) 131-150
 66. Poincare series and comparison theorems for variable negative curvature (with R. Sharp), *Amer. Math. Soc. Transl.* 202 (2001) 229–240
 67. Contraction in mean and transfer operators., *Dyn. Syst.* 16 (2001) 97–106
 68. Statistical properties of maps with indifferent periodic points (with M. Yuri), *Comm. Math. Phys.* 217 (2001) 503–520
 69. Zeta functions for certain multi-dimensional non-hyperbolic maps (with M. Yuri), *Nonlinearity* 14 (2001) 1265-1278
 70. Livsic’s theorem for semi-simple Lie groups (with M. Nicol), *Ergod. Th. and Dynam. Sys.* 21 (2001) 1501-1509
 71. Asymptotic expansions for closed orbits in homology classes (with R.Sharp) *Geometriae Dedicata* 87 (2001) 123-160
 72. Computing the dimension of dynamically defined sets (with O. Jenkinson), *Ergod. Th. and Dynam. Sys.*, 21 (2001) 1429-1445
 73. Dynamical zeta functions , *Proc. Symp. Pure Math.* 69 (2001) 409-427
 74. The dynamics of Schelling-type segregation models and a nonlinear graph Laplacian variational problem (with H. Weiss) *Adv. in Appl. Math.* 27 (2001) 17–40
 75. Ergodicity of stable manifolds for nilpotent extensions of Anosov flows, *Disc. Cont. Dynam. Sys.*, 8 (2002) 599-604
 76. Calculating Hausdorff dimension of Julia sets and Kleinian limit sets (with O. Jenkinson), *Amer. J. Math.* 124(2002)495-545
 77. Invariance principles for interval maps with an indifferent fixed point (with R. Sharp), *Commun. Math. Phys.*, 229 (2002) 337-346
 78. Ergodic prpoerties of linear actions by (2×2) -matrices (with F. Ledrappier), *Duke Math. J.*, 116 (2003) 353-388
 79. Stability of mixing rates for Axiom A attractors, *Nonlinearity*, 16 (2003) 567-578
 80. Hausdorff dimension and asymptotic cycles, *Trans. Amer. Math. Soc.*, 355 (2003) 3241–3252.
 81. Time delay coordinates and polynomial mappings, *Advances in Math.*, 177 (2003) 280-296
 82. Stable ergodicity and frame flows (with K. Burns), *Geom Dedicata* 98 (2003) 189-210
 83. Free energy as a dynamical and geometric invariant (with H. Weiss), *Commun. Math. Phys.* 240 (2003) 457–482
 84. Livsic theorems, maximizing measures and the stable norm (with R. Sharp) , *Dyn. Syst.* 19 (2004) 75-88
 85. Some remarks on the dynamics of the mixmaster universe (with H. Weiss) *Qual. Theory Dyn. Sys.* 4 (2004) 425–438
 86. Orthonormal expansions of invariant densities for expanding maps (with O. Jenkinson), *Advances in Math.* , 192 (2005)1–34
 87. Transitivity of Euclidean extensions of Anosov diffeomorphisms (with V. Nitica), *Ergodic Theory and Dyn. Sys.*,25 (2005) 257–269
-

-
88. Local Hölder regularity of densities and Livsic theorems for non-uniformly hyperbolic diffeomorphisms, *Discrete Contin. Dyn. Syst.*, 13 (2005) 1247–1256
 89. Distribution results for lattices in $SL(2, Q_p)$ (with F. Ledrappier), *Bull. Braz. Math. Soc.*, 36 (2005) 143–176
 90. Free energy as a geometric invariant (with H. Weiss) *Comm. Math. Phys.* 260 (2005), no. 2, 445–454
 91. Angular self-intersections for closed geodesics on surfaces *Proc. Amer. Math. Soc.* (with R. Sharp) 134 (2006) 419–426
 92. Correlations for pairs of closed geodesics, *Invent. Math.*, 163 (2006), 1–24
 93. Properties of measures supported on flat Sierpinski carpet (with T. Jordan), *Ergod. Th. and Dynam. Sys.*, 26 (2006) 739–754: [including Addendum: Positive-measure self-similar sets without interior (with M. Csornyei, T. Jordan, D. Preiss and B. Solomyak) *Ergod. Th. and Dynam. Sys.*, 26 (2006) 755–758]
 94. Skew products and Lie theory (with W. Parry), *Translations Amer. Math. Soc.*, 217 (2006) 139–165
 95. Distribution of ergodic sums for hyperbolic maps (with R. Sharp), *Translations Amer. Math. Soc.*, 217 (2006) 167–183
 96. Hausdorff dimension for randomly perturbed self affine attractors (with T. Jordan and K. Simon), *Comm. Math. Phys.* 270 (2007), no. 2, 519–544
 97. A dynamical approach to accelerating numerical integration with equidistributed points, (with O. Jenkinson) *Tr. Mat. Inst. Steklova* 256 (2007), *Din. Sist. i Optim.*, 290–304
 98. Pseudo-Anosov foliations on periodic surfaces, (with R. Sharp) *Topology Appl.* 154 (2007), no. 12, 2365–2375
 99. Pair correlations of sequences in higher dimensions, (with R. Nair) *Israel J. Math.* 157 (2007), 219–238.
 100. Chebotarev-type theorems in homology classes, (with R. Sharp) *Proc. Amer. Math. Soc.* 135 (2007), no. 12, 3887–3894
 101. Distribution of orbits for Mobius groups, *Fields Institute Communications*, 51 (2007) 329–339
 102. Hausdorff dimension for randomly perturbed self affine attractors (with T. Jordan and K. Simon), *Comm. Math. Phys.* 270 (2007) 519–544.
 103. Countable state shifts and the uniqueness of g -measures, (with A. Johansson and A. Oberg), *Amer. J. Math.*, 129 (2007), no. 6, 1501–1511
 104. Multifractal analysis and the variance of Gibbs measures, (with T. Jordan) *Journal of the London Mathematical Society*, 76 (2007) 57–72.
 105. An analogue of Bauer’s theorem for closed orbits of skew products (with W. Parry, posthumously) *Ergodic Theory and Dynamical Systems*, 28 (2008) 535–546
 106. Addendum: An analogue of Artin reciprocity for closed orbits of skew products (with R. Sharp) *Ergodic Theory and Dynamical Systems*, Volume 28 (2008) 547–552
 107. Stable ergodicity for partially hyperbolic attractors with negative central exponents, (with Keith Burns, Dmitry Dolgopyat, and Yakov Pesin), *Journal of Modern Dynamics*, 2 (2008) 63–81
 108. How smooth is your wavelet? Wavelet regularity via thermodynamic formalism, (with H. Weiss) *Communications in Mathematical Physics* 281 (2008) 1–21.
 109. Periodic orbits and holonomy for hyperbolic flows, in *Geometric and Probabilistic Structures in Dynamics*, (with R. Sharp) *Contemporary Mathematics* 469, 289–302, (2008)
-

-
110. Limiting distributions for geodesics excursions on the modular surface, in Spectral analysis in geometry and number theory, 177–185, Contemp. Math., 484, Amer. Math. Soc., 2009
 111. Large deviations, fluctuations and shrinking intervals, (with R. Sharp) Comm. Math. Phys. 290 (2009) 321–334.
 112. Large deviations for intermittent maps, (with R. Sharp) Nonlinearity 22 (2009) 2079–2092.

BOOKS

1. Zeta functions and closed orbits for hyperbolic systems (with W. Parry), *Asterisque* (Soc. Math. France), 187-188 (1990) 1-268
2. Lectures on Pesin Theory and ergodic theory on manifolds, *London Mathematical Society Lecture Notes Series* vol. 180, C.U.P., Cambridge, 1992
3. Dynamical Systems and Ergodic Theory (with M. Yuri), *London Mathematical Society Student Text Series*, vol. 40, C.U.P., Cambridge, 1998

SURVEYS AND ARTICLES IN CONFERENCE PROCEEDINGS

1. Distributions at infinity for Riemann surfaces, in Proc. Conf. “Dynamical Systems and Ergodic Theory”, Stefan Banach Center, vol. 23, 1989
2. Closed Geodesics and Zeta functions, in Proc. Conf. “Ergodic theory and Hyperbolic Geometry”, O.U.P., Oxford, 1990, pp. 153-173
3. Notes on thermodynamic formalism for Anosov flows, in “Rencontres de theorie spectrale et geometrie”, Grenoble, 1991, pp.123-128
4. Symbolic dynamics and geodesic flows, in “Seminaire de theorie spectrale et geometrie”, Chambéry-Grenoble, 1991-1992, pp.1-20
5. The story of the solution of the Feigenbaum conjectures, Proceedings of the conference in honour of the 50th anniversary of the Centro de Matematica do Porto, pp.75-85
6. On the Ruelle-Tangerman theorem for zeta functions, Proceedings of the European Conference on Iteration Theory, Lisbon, 1991, pp.201-209
7. Infinitesimal Rigidity of Group Actions with Hyperbolic Generators, in *Dynamical Systems and Applications* World Scientific Series In Applicable Analysis 4, pp.589-599
8. Entropy and geodesic arcs on surfaces, Proceedings of the International conference on dynamical systems *Pitman research Notes in Mathematics* 362, 1996.
9. Stability of mixing for toral extensions (with W. Parry) *Proceedings of the Steklov Institute*, vol. 216, 1997, pp. 350-359
10. Notes on thermodynamic formalism for Anosov flows. Rencontres de Thorie Spectrale et Gomtrie (Aussois, 1991), 123–128
11. Addendum to “Periodic orbits and dynamical spectra, by V. Baladi” (with D. Dolgopyat), *Ergodic Theory and Dynamical Systems*, 18 (1998), no. 2, 293–301.
12. Periodic orbits and zeta functions, in Handbook of Dynamical Systems, vol IA, Elsevier, (2002) 409-452
13. Entropy, exponents and invariant densities for hyperbolic systems: Dependence and computation (with O. Jenkinson), in Modern Dynamical Systems and its Applications(eds. M. Brin, B. Hasselblatt, Y. Pesin), C.U.P., Cambridge, 2004

14. Dynamical zeta functions and closed orbits for geodesic and hyperbolic flows. *Frontiers in number theory, physics, and geometry. I*, 379–398, Springer, Berlin, 2006.
15. The mathematical research of William Parry FRS, (with R. Sharp, S. Tuncel and P. Walters *Ergodic Theory and Dynamical Systems*, 28 (2008) 321-337

3 Teaching

UNDERGRADUATE COURSES TAUGHT:

Functional Analysis (3rd year; Edinburgh, 1986), Ergodic Theory (4th year; 1993), Dynamical Systems (4th year; Warwick, 1994 and 2006), Measure Theory (3rd year; Warwick, 1995), Chaotic Dynamics (3rd year; Manchester 1999-2000), Calculus of several variables (3rd year; Manchester 2001-2004), Modern Analysis (4th year; Manchester 2001-2004), Projective Geometry (2nd Year; Manchester 2000-2004), Analysis I (1st year; Warwick 2005-2009), Ergodic Theory (4th year, Warwick 2006), Dynamical Systems (4th year; Warwick 2006-07, 2009).

POSTGRADUATE COURSES TAUGHT:

Numbers and Dynamics (Warwick, 1984), Dynamical Systems (Edinburgh, 1985 and Porto, 2005), Pesin Theory (Porto, 1989), Fractals and Dynamics (Porto, 2005),

PhD STUDENTS:

Dr. Oliver Jenkinson, Warwick, 1997	Dr. Charmaine Leech, Warwick, 1997
Dr. Zainab Kazim, Manchester, 1999	Dr. Vincent Evanno, Manchester, 2000
Dr. Shrihari Shridan, Manchester, 2004	Dr. H. Xia, Manchester, 2004
Dr. Thomas Jordan, Manchester 2005	Dr. Dan Thompson, Warwick 2009

POST-DOCTORAL ASSISTANTS:

Dr. Kit Nair, Edinburgh, 1995-98	Dr. Charles Walkden, Manchester, 1997-99
Dr. Patrick Verovic, Manchester, 1998	Dr. Alistair Windsor, Manchester 2001-2004
Dr. Thomas Jordan, Warwick 2005-2007	Dr. Karoly Simon, Warwick 2006-2007
Dr. Ian Morris 2007-2010	

4 Other professional duties

ADMINISTRATION:

Head of Pure Mathematics, Manchester University, 1997-98 and 2001-2004
Chair of Departmental Board, Manchester University, 2004-05
Director of Postgraduate Studies, Warwick University, 2005-
Member of the EPSRC Mathematics College, 1997 -
(and advisor to NSF, CNRS, RAE panels)
INTAS-FSU Grant (Co-ordinator), 1995-99
(Various, EPSRC, Royal Society, London Mathematics Society and Leverhulme grants)
Professorial appointment committees (Leicester, Loughborough, Manchester, UEA, Warwick)

SELECTED INTERNATIONAL MEETINGS AS ORGANIZER:

International Conference on Dynamical Systems, Porto, Aug. 1992
Ergodic theory of Z^d -actions, Warwick, 1993-94
Stochastic analysis, Lisbon June 1994
Ergodic Theory on Riemannian Manifolds, Warwick, June 1995
Ergodic Theory, Geometric Rigidity and Number Theory, Newton Institute (Cambridge), Jan-Jul. 2000.

Probabilistic Limit Laws for Dynamical Systems, ICMS (Edinburgh) 2005
Workshop on Ergodic Theory and Geometry, Manchester 2008
Symposium on Ergodic Theory and Dynamical Systems, Warwick, 2010-11