

HYMAN BASS

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Birth: October 5, 1932 in Houston, Texas, U.S.A. Citizenship: U.S.A.

EDUCATION

B.A. (1955) Princeton University: Mathematics
M.S. (1956) University of Chicago: Mathematics
Ph.D. (1959) University of Chicago: Mathematics: Advisor: I. Kaplansky

PROFESSION

Teaching and research in mathematics and mathematics education. Chief fields of research interest: In mathematics: algebraic K-theory; number theory; group theory (geometric methods); algebraic geometry. In mathematics education: Subject matter knowledge entailed in teaching; practice-based research on teaching and learning; teacher education; reasoning and proof in school mathematics; analysis of curriculum materials.

CAREER:

University of Michigan
Roger Lyndon Collegiate Professor of Mathematics and of Mathematics Education, 1999-present
Columbia University Mathematics Department.
Adrain Professor: 1992-99
Professor: 1965-92.
Chair: 1975-79.
Associate Professor and Chair at Barnard: 1964-65.
Assistant Professor: 1963-64.
Ritt Instructor: 1959-62.

FELLOWSHIPS

Guggenheim Fellow, Inst. des Hautes Études Scientifiques, Paris - 1968-69
Sloan Fellow - 1964-66
NSF Postdoctoral Fellow, College de France - 1962-63
NSF graduate fellow, University of Chicago - 1955-59

RECENT GRANTS

Using Practice as a Site to Learn Mathematics for Teaching: Developing Materials, Approaches, and Professional Community. National Science Foundation, Teacher Professional Continuum, \$1.6 million, 2005-2010 (Co-PI with Kara Suzuka)
Center for Proficiency in Teaching Mathematics (UM & U Georgia CLT) \$5 million, 2003-2008 (one of several co-PIs)
Design, Validation, and Dissemination of Measures of Content Knowledge for Teaching Mathematics. National Science Foundation, Mathematics-Science Partnerships Program. \$5 million, 2003-08. (Co-principal investigator with Heather Hill, et al.)

Developing a Practice-Based Theory of Mathematics Knowledge for Teaching. National Science Foundation. (Co-principal investigator, Deborah Ball.) \$1.8 million, 2001-2004.
Crossing Boundaries: Probing the Interplay of Mathematics and Pedagogy in Elementary Mathematics Teaching. The Spencer Foundation, (Co-principal investigator, Deborah Ball.) \$302,000, 1998 - 2000.
Geometric methods in group theory, National Science Foundation, \$78,638.00, 1999-2001.

OTHER ACADEMIC APPOINTMENTS

Hebrew University of Jerusalem, Institute for Advanced Study, summer, 2000
University of Michigan, visiting professor, 1997-1998.
Tata Institute of Fundamental Research in Bombay, India, visiting professor; winter 1965-66, summer 1969, summer 1976, fall 1979, fall 1990, summer 1995.
Hong Kong University, External Examiner, Dept. of Mathematics, 1994-97
University of Southern California, Visiting Distinguished Lecturer - Jan., 1986; Jan., 1987; May, 1989; Jan. and May, 1990, Jan., 1991, Jan., 1992, Jan., 1993, Jan., 1994.
Mathematical Sciences Research Institute, Berkeley - Sept., 1989
Universita di Roma - May, 1987
Ecole Normale Superieure, Spring 1980.
Mittag-Leffler Institute, Stockholm - April, 1980
Institute for Advanced Study in Princeton, visiting member - Summer 1964, 1965-66, Summer 1975, Summer 1979.
Univ. of California, Berkeley - Winter 1977-78
Univ. of Utah, Salt Lake City - Fall 1977
Instituto de Matematica Pura e Applicada, Rio de Janeiro, visiting professor; Summer 1977.
Cambridge University in England, Trinity College, visiting professor - Lent term, 1973.
Universite de Paris, brief visiting appointments - Fall 1968, Spring 1973.
Institut des Hautes Études Scientifiques, Paris, visiting member - 1968-69.
Universidad Nacional Autonoma de Mexico, visiting professor - Summer 1965.

LECTURESHIPS

Kieval Lecturer, Humboldt State University, Arcata, CA, February, 2003
Erdos Lecture, University of Florida, February, 2001.
Myhill Lecturer, SUNY Buffalo, April, 2000.
Kolchin Memorial Lecture, Columbia University, February, 2000.
Knight Lecturer, University of Manitoba, June, 1997.
McLean Lecturer, Collegiate School, May, 1997
AMS Arnold Ross Lecturer, U. Maryland, April, 1996.
Western Canada Algebra Conference, Principal Lecturer, Feb., 1993.
Kansas State University, Distinguished Lecturer - 198?
University of Indiana, Distinguished Lecturer - 1982.
University of Oklahoma, Karcher Lecturer - August, 1979.
University of Tennessee, Barrett Memorial Lecturer - March, 1978.
American Mathematical Society - invited address, Cambridge, fall, 1969; Pretoria, SA, summer, 1997; Colloquium Lecturer, Atlanta, January, 1978.
Univ. of California at Santa Barbara, Visiting Lecturer - January, 1977.
Haverford College, Phillips Lecturer - fall 1970, 1975.
International Congresses of Mathematicians, invited half-hour addresses - Moscow, 1966; Vancouver, 1974.
CBMS Regional conference on Algebraic K-theory, Colorado State Univ., principal lecturer - August, 1973.

British Mathematical Colloquium, invited address - spring, 1973.
 Battelle Conference on Algebraic K-theory, Seattle, Washington, organizer, lecturer, and proceedings editor - August, 1972.
 Advanced Institute in Algebra, Univ. of Madurai, India, principal lecturer - summer 1971.
 Mathematical Association of America, Hedrick Lecturer -1968
 NSF Institute on Algebraic Groups, Bowdoin College, principal lecturer -summer 1968.
 NSF Algebra Institute, Univ. of Oregon, principal lecturer - summer 1962.
 American Mathematical Society, Retiring Presidential Address, Phoenix, January, 2004
 International Congress on Mathematical Education, Plenary Address, Copenhagen, July 2004.

RECENT INVITED PRESENTATIONS, PROFESSIONAL MEETINGS, WORKSHOPS, & REVIEWS

2007

- (April) American Educational Research Association – Chicago. Presentation of UM “mod4” project. Panel on the future of the Carnegie Foundation for the Advancement of Teaching.
- (March) NCTM, Atlanta. Presentation of UM “mod4” project. Meeting of US National Committee on Math Instruction.
- (March) Chaired review of the U Nebraska Math Dept
- (February) Education talk and workshop at Cal State Northridge, Teachers for a New Era Project
- (February) MSRI, Invited address for Remembrance of Irving Kaplansky
- (January) American Assn of Teacher Educators, Irvine, CA. Presentation with the UM Center for Proficiency in Teaching Mathematics
- (January) International Program Committee for ICME 11 in Monterrey, Mexico.
- (January) NYC. Review of College Board standards.
- (January) AMS/ MAA – New Orleans. Conducted mathematician interviews using the measures developed in the Learning Math for Teaching project at UM.

2006

- (December) Mumbai, India. Visit and talks at the Homi Bhabha Center for Science Education (plus visits to local schools), and an invited talk at the conference on Projective modules and complete intersections at the Tata Institute of Fundamental Research.
- (November) Advisor to Jefferson County (KY) Public Schools Standards Project
- (November) Chaired Executive Committee meeting of ICMI, in Cartagena, Colombia
- (November) Advisory Board to Institute of Mathematics and Education at U Arizona
- (October) Invited talk at conference on polynomial automorphisms, in Hanoi, Vietnam.
- (August) ICM Madrid, participant in the General Assembly of IMU, and invited participation in a panel on “e-learning of mathematics”
- (August) Universities in New Zealand, talks on mathematics and math education
- (July) Park City Math Institute, International Seminar and Elementary Math Lab
- (June) Review of the Wisconsin Center for Educational Research, U Wisconsin, Madison
- (May) NYC Public School System: Chancellor’s Math Advisory Panel
- (April) Columbia U Math Dept reunion, invited talk
- (March) Review of U Illinois at Chicago Dept of Math, Stat, and CS
- (March) Conversations Among Colleagues conference, U Michigan.
- (February) Cal State Univ. at Northridge, Math Education
- (February) International Program Committee for ICMI Centennial, Rome.

2005

- (December) National Conference on Mathematics Education, Delhi, India
- (November) U Michigan at Flint, Dept of Mathematics
- (September) U. Kentucky, Dept of Mathematics.
- (September) Analysis of mathematics items in NAEP, Brookings Institution.

(August) Milwaukee Mathematics Partnership
 (August) (w/ D. Ball) Mathematics Education and Learning, Strobl, Austria
 (July) Park City Mathematics Institute, Elementary Mathematics Lab
 (June) 1st ICMI Regional Africa Conference, U. Witwatersrand, SA
 (June) 125th Anniversary of Teacher Education at UM
 (May) MSRI Workshop on Mathematical Knowledge for Teaching, Asilomar
 (May) ICMI Study #15, on Teacher Education, Aguas de Lindoia, Brazil
 (May) Review of DePaul U Dept of Math Sciences
 (April) Mathematics, Mathematicians, and Mathematics Education. Plenary address at the Educational Advancement Foundation Conference, Austin, TX.
 (April) AERA, Montreal
 (April) NCTM, Anaheim
 (March) U. Toledo, "Zeta Functions of Graphs," plus an education talk.
 (February) Cal State Northridge, Professional Development Workshop
 (January) AMTE, Dallas

HONORS AND PRIZES

The Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics, Mathematical Association of America, 2006
 Elected Associate Fellow of the Third World Academy of Sciences (Trieste, Italy), 2002.
 Princeton Class of 1955 Award, 1997.
 Phi Beta Kappa National Visiting Scholar, 1991-92.
 Elected member of the National Academy of Sciences, 1982.
 Elected member of the American Academy of Arts and Sciences, 1980.
 Elected Fellow of the American Association for the Advancement of Science, 1986.
 Cole Prize in Algebra, American Mathematical Society, 1975.
 Van Amringe Prize, Columbia University, for the book, "Algebraic K-theory," 1969.

EDITORIAL ACTIVITIES

Birkhauser/ *Springer, Progress in Mathematics*: 1995-present
Bulletin, American Mathematical Society: 1969-77, 1982-1986
Journal of Pure and Applied Algebra: 1970-86
Communications in Algebra, 1974-1985
Annals of Mathematics, 1978-1984
American Journal of Mathematics.: 1971-77
 Academic Press Series in Pure and Applied Mathematics: 1974- present
 North-Holland Mathematical Library, North-Holland Publishing Co.: 1971- present
Journal of the Indian Mathematical Society: 1968-70
Cambridge Tracts in Pure and Applied Mathematics.: 1968- present
Britannica Yearbook on Science: occasional contributor

SCIENTIFIC SOCIETIES AND COMMITTEES

American Mathematical Society:
 President, 2001-2003
 President-elect, 2000-2001
 Board of Trustees, 1995-98
 Committee on Education, chair, 1995- 2000
 Federal Policy Agenda Comm. 1992-
 Science Policy Committee 1982-90; Chair, 2003 -
 Executive Committee and Long Range Planning Comm., 1984-1988

Member of Council, 1969-1977
 Representative as Amer. Jour. Math. Editor, 1971-1977,
 Vice President, 1980-81

Mathematical Association of America.
 American Association for the Advancement of Science,
 Chairman, Section A 1987-1988; 1997-1998

Visiting Committees for various mathematics departments and systems:
 Princeton, Northwestern, U. Iowa, UCSB, Dartmouth. U. Virginia, Dartmouth, Institute for
 Advanced Study, Rutgers University, The System of Mathematical Centers in Portugal, St
 John's U., Vanderbilt, Florida State System, University of Texas at Austin, DePaul University,
 University of Illinois at Chicago, University of Nebraska

NSF Division of Mathematics, Advisory Panel, 1973-75
 Committee to select speakers in the algebra section for the International Congresses of
 Mathematicians, 1970, 1974, 1978 (chairman). For the section on Teaching and Popularization of
 Mathematics (chair) 2002.

Société des collaborateurs de N. Bourbaki, 1970-1982.
 Mathematical Sciences Research Institute, Berkeley,
 Board of Trustees, Chairman, 1981-86
 Science Advisory Council, Member, 1987-92, Chairman, 1989-92.
 Steering Committee, 1989-92.
 Educational Advisory Committee, 2004 -

American Academy of Arts and Sciences, member, 1981 -
 National Academy of Sciences, member, 1982-
 National Research Council:
 Various Committees and Panels,
 Board on Mathematical Sciences, member, 1984-87, 1993-96
 Mathematical Sciences Education Board, member, 1991-93, Chair, 1993-2000.
 Study panel on how children learn mathematics, which produced the study, "Adding
 It Up; Helping children learn mathematics," (2001).
 Center for Science, Mathematics and Engineering Education, 1993-2000.
 US National Committee on Mathematics Instruction, 1998 -

National S&T Center for Computation and Visualization of Geometric Structures,
 University of Minnesota,
 External Advisory Board, 1991-95,
 Board of Governors, 1995-97.

Institute for Advanced Study,
 Member, Board of Trustees, 1992 -1997
 Oversight Board, Park City/ IAS Mathematics Institute, 1993 -

International Commission on Mathematics Instruction, President, 1998-2006.
 RAND Mathematics Panel, 1999-2002

MATHEMATICS PUBLICATIONS

1. Finite monadic algebras, Proc. AMS 9 (1958), 258-268.
2. Finitistic dimension and a homological generalization of semiprimary rings, Trans. AMS 95 (1960), 466-488.
3. Projective modules over algebras, Ann. of Math., 73 (1961), 532-542.
4. Injective dimension in noetherian rings, Trans. AMS 102 (1962), 18-29.
5. Torsion free and projective modules, Trans. AMS 102 (1962), 319-327.
6. (with S. Schanuel) The homotopy theory of projective modules, Bull. AMS 68 (1962), 425-428.
7. Big projective modules are free, Illinois Jour. Math. 7 (1963), 24-31.
8. On the ubiquity of Gorenstein rings, Math. Zeit. 82 (1963), 8-28.
9. (with J.-P. Serre and M. Lazard) Sous-groupes d'indice fini dans $SL(n, \mathbb{Z})$, Bull. AMS 70 (1964), 385-392.
10. The stable structure of quite general linear groups, Bull. AMS 70 (1964), 429-433.
11. An algebraic analogue of Bott's complex periodicity theorem, Mimeo. notes, Columbia University (1964).
12. Projective modules over free groups are free, Jour. of Algebra 1 (1964) 367-373.
13. K-theory and stable algebra, Publ. de l'Inst. des Hautes Etudes Scientifiques, no. 22 (1964) 489-544.
14. (with A. Heller and R. Swan,)The Whitehead group of a polynomial extension, Publ. de l'Inst. des Hautes Etudes Scientifiques, France, no. 22 (1964) 61-79.
15. A remark on an arithmetic theorem of Chevalley, Proc. AMS, 16 (1965), 875-878.
16. The Dirichlet unit theorem, induced characters, and Whitehead groups of finite groups, Topology, 4 (1966), 391-410.
17. Generators and relations for cyclotomic units, Nagoya Math. J. 27 (1966), 401-407.
18. Topics in Algebraic K-theory, Lecture notes, Tata Institute of Fundamental Research, Bombay (1966).
19. (with M.P. Murthy) Grothendieck groups and Picard groups of abelian group rings, Ann of Math. 86 (1967), 16-73.
20. Whitehead groups and Grothendieck groups of groups rings, (half-hour address), Proc. International Congress of Mathematicians, Moscow (1966) 262-268.
21. (with J. Milnor and J.-P. Serre) Solution of the congruence subgroup problem for SL_n ($n \geq 3$) and $Sp_{2n}(n \geq 2)$, Publ. IHES 33, Paris (1967), 59-137.
22. The congruence subgroup problem, Proc. Conference on Local Fields, Driebergen (1966), 16-22.
23. Algebraic K-theory, W.A. Benjamin, New York (1968), 762 pp.
24. Modules which support nonsingular forms, J. Algebra 13 (1969), 246-252.
[B] A. Borel, Linear algebraic groups, W.A. Benjamin, New York (1969), 398 pp. Notes prepared, except for the last chapter, from a course of Borel at Columbia in the spring of 1968, and a course based on Borel's which I gave at the Bowdoin summer institute on algebraic groups in 1968.
[S] J.-P. Serre, Groupes discrets, cours redigé avec la collaboration de H. Bass, Collège de France (1968).
25. Descending chains and the Krull ordinal of commutative rings, J. Pure and Applied Alg. 4 (1971), 347-360.
26. K_2 des corps globaux (d'après Tate, H. Garland), Séminaire Bourbaki, No. 394 (juin, 1971).
27. The degree of polynomial growth of finitely generated nilpotent groups, Proc. London Math. Soc. 25 (1972), 603-614.
28. (with T. Soundararajan), A property of profinite groups and the converse of classical Galois theory, Jour. Indian Math. Soc. 36 (1972), 1-7.
29. Proceedings of the Battelle Conference on algebraic K-theory, I, II, III, Springer Lecture Notes in Mathematics, vols. 341, 342, 342(1972).

- 29a. Some problems in "classical" algebraic K-theory, Vol. II, 3-73.
- 29b. (with J. Tate), The Milnor ring of a global field, Vol. II, 349-446.
- 29c. Unitary algebraic K-theory, Vol. III, 57-265.
- [Q] D. Quillen, Finite generation of the groups K_i of rings of algebraic integers, Vol. I, 179-198: Article prepared from notes on Quillen's lecture.
30. Modules et anneaux semi-simples, § 1-9. Redaction prepared for the re-edition of Bourbaki's Algèbre, Ch. 8.
- 30a. Modules et anneaux semi-simples, the final three sections: § 10. Groups et anneaux de Grothendieck; § 11. Représentations linéaires § 12. Représentations des groupes finis .
31. Introduction to some methods of algebraic K-theory, C.B.M.S. Regional Conf. Series in Math., No. 20 (1974), 68 pp.
32. L_3 of finite abelian groups, Ann. Math. 99 (1974), 118-153.
33. Clifford Algebras and spinor norms over a commutative rings, Amer. Jour. Math. XCVI (1974) 156-206.
34. Libération des modules projectifs sur certains anneaux de polynômes, Sém. Bourbaki, juin 1974, No. 448, 25 pp.
35. Algebraic K-theory: A historical survey, Proc. International Congress of Mathematicians, Vancouver (1974) 277-283.
36. Euler characteristics and characters of discrete groups, Inventiones Mathematicae 35 (1976) 155-196.
37. (with D.L. Wright) Localisation in the K-theory of invertible algebras, Journal of Pure and Applied Algebra, 89-105.
38. Some remarks on group actions on trees, Comm. in Algebra, 4, (1976) 1091-1126.
39. (with E.H. Connell and D.L. Wright), Locally polynomial algebras are symmetric, Bull. AMS 82 (1976) 719-120.
40. (with E.H. Connell and D.L. Wright) Locally polynomial algebras are symmetric algebras, Invent. math 38 (1977) 279-299.
41. (with W. Pardon), Some hybrid symplectic group phenomena Jour. of Algebra, 53 (1978) 327-333.
42. Quadratic modules over polynomial rings, in Contributions to Algebra, in honor of E.R. Kolchin, Acad. Press, N.Y. (1977) 1-23.
43. Groups of integral representation type, Pacific Jour. Math., 86 (1980) 15-51.
44. Traces and Euler characteristics, in Combinatorial and Homological Methods in Group Theory, London Math. Soc. Lecture Notes 36 (1979) 1-26.
45. Projective Modules and Symmetric Algebras (notes by T.M. Viswanathan) Instituto Matematica Pura e Aplicada, Rio de Janeiro, Brazil (1978).
46. Report on the Fields Medal Prize to Daniel Quillen, Science, v. 202, (3 Nov., 1978), 505-506.
47. Lenstra's calculation of $G_0(\mathbb{R}[\square])$, and applications to Morse-Smale diffeomorphisms, Integral representations and applications, LNM, 882, Ed. K.W. Roggenkamp, Springer-Verlag (1981), 287-318.
48. (with John Morgan, as editor) The Smith Conjecture, Academic Press, New York (1984).
49. Finitely generated subgroups of GL_2 , in The Smith Conjecture, Academic Press, New York (1984) 127-136.
50. (with E.H. Connell and D. Wright) The Jacobian Conjecture: Reduction of degree and formal expansion of the inverse, Bull. Amer. Math. Soc. 7 (1982) 287-330.
51. Theorems of Jordan and Burnside for algebraic groups, Jour. Algebra, 82 (1983) 245-254.
52. (with Alex Lubotzky) Automorphisms of groups and of schemes of finite type, Israel Jour. Math 44 (1983) 1-22.
53. The Jacobian Conjecture and Inverse Degrees, in Arithmetic and Geometry, Vol. I, papers dedicated to I.R. Shafarevich, Birkhauser (1983) 65-75.
54. (with Gary Meisters) Polynomial flows in the plane, Advances in Math. 55 (1985) 173-208.
55. A non-triangular action of G_a on A^3 , Jour. Pure and Applied Algebra, 33 (1984) 1-5.

56. (with William Haboush) Linearizing certain reductive group actions, Trans.Amer. Math. Soc. 292 (1985) 463-482.
57. (with Roger Alperin) "Length functions of group actions on Λ -trees," in Combinatorial Group Theory and Topology, Annals of Mathematics Studies 111, Princeton Univ. Press (1987) 265-378.
58. "Algebraic group actions on affine spaces," in Group Actions on Rings, Contemporary Mathematics, Amer. Math. Soc. vol 43 (1985) 1-23.
59. (with W. Haboush) Some equivariant K-theory of affine algebraic group actions, Comm. in Algebra 15 (1987) 181-217.
60. Group actions on non archimedean trees, Proc. Workshop in Arboreal Group Theory, MSRI (1988) , MSRI Publications 19, Springer-Verlag (1991) 69-131.
61. Differential structure of étale extensions of polynomial algebras, in Commutative Algebra, MSRI Publications 15, Springer-Verlag (1989) 69-109.
62. La Conjecture Jacobiënne et Opérateurs Différentiels, Colloque en l'Honneur de Pierre Samuel, Paris, (1987), Soc. Math. de France, Memoire no. 38, 39-50.
63. Linearizing flat families of linear representations, Topological methods in algebraic transformation groups., Progress in Math. Vol. 80, Birkhauser Boston (1989), 5-10.
64. "Linearization problems on affine varieties," in Algebraic Structures and Number Theory, Eds. S.P. Lam and K. P. Shum, World Scientific, Hong Kong (1988)1-9.
65. (with R. Guralnick) "Projective modules with free multiples and powers," Proc. Amer. Math. Soc. 96 (1986) 207-208.
66. (with R. Guralnick) "Torsion in the Picard Group and Extension of Scalars," Jour. Pure and Applied Algebra 52 (1988) 213-217.
67. "Covering theory for graphs of groups," Jour. Pure and Applied Algebra, 89 (1993) 3-47.
68. (with R. Kulkarni) "Uniform tree lattices." Jour. AMS 3, (1990) 843-902.
69. "The Ihara-Selberg zeta function of a uniform tree lattice" International Jour.Math. 3, (1992) 717-797.
70. "A finiteness property of affine algebras" Proc. AMS 110, (1990) 315-318.
71. John Milnor the Algebraist, in New Topological Methods in Mathematics, Publish or Perish, Inc. (1993) 45-84.
72. (with D. Estes and R. Guralnick) "Eigenvalues of symmetric matrices and graphs," Jour. Algebra ,168 (1994) 536-567.
73. (with A. Lubotzky) "Linear-central filtrations on groups," in "The mathematical heritage of Wilhelm Magnus - groups, geometry, and special functions., Contemporary Mathematics, AMS, vol 169 (1994) 45 - 97.
74. (with A. Lubotzky) "Rigidity of certain group actions on locally finite trees," Proc. London Math. Society, 69 (1994) 541-575.
75. (with M. V. Otero-Espinar, D. Rockmore, and C. Tresser) Cyclic Renormalization and Automorphism Groups of Rooted Trees, Springer Lecture Notes in Mathematics 1621, (1996) (176 pages).
76. (with Renfang Jiang) "Automorphism groups of tree actions and of graphs of groups," Jour. Pure and Applied Algebra, 112 (1996) 109-155.
77. (with I. Kra) "Lipman Bers (22 May 1914-29 October 1993)," Proc. Amer. Philosophical Society, 140, No. 2, June, 1996, 206-219.
78. "Samuel Eilenberg (1913-1998)," Memorial article, Notices AMS, November, 1998
79. (with Anderemi Kuku and Claudio Pedrini), Editor of Proceedings of a Workshop and Conference on Algebraic K-theory, at the International Center for Theoretical Physics in Trieste, September, 1997, World Scientific (1999).
80. "A professional autobiography," in Algebra, K-theory, Groups, Education, Proceedings of a conference on the occasion of the 65th birthday of Hyman Bass, Contemporary Mathematics, American Mathematical Society, (2000)
81. (with Alex Lubotzky) "Non-arithmetic super-rigid groups: Counterexamples to Platonov's Conjecture." Annals of Mathematics, 151 (2000), 1151-1173.

82. (with A. Lubotzky), "Tree lattices," Birkhauser Boston, (2001) (233 pages)
83. (with J. Tits) "Discreteness criteria for certain tree automorphism groups," Appendix to "Tree Lattices" Birkhauser Boston, (2001)
84. (with L. Carbone and G. Rosenberg) "The existence theorem for tree lattices," Appendix to "Tree Lattices" Birkhauser Boston, (2001)
85. (with A. Lubotzky, A. Magid, and S. Mozes) "The pro-algebraic completion of rigid groups." Geometriae Dedicata, 95 (2002), 19-58.
86. "Personal reminiscences of the birth of algebraic K-theory," K-Theory 30 (2003), 203-209.
87. "Equivariant Asanuma algebras," (in preparation).
88. "Biography of Samuel Eilenberg," for National Dictionary of Scientific Biography (in press)
89. (w/ T.-Y. Lam) Memorial article for Irving Kaplansky (1917-2006), Notices of the American Mathematical Society (in preparation)
90. (w. T.-Y. Lam) "Collected papers of John Milnor: Algebra" (in preparation)

MATHEMATICS EDUCATION PUBLICATIONS

1. Let's measure what's worth measuring. Commentary in Education Week, October 27, 1993.
2. Education at the Academy: The debate that never happened. In the National Academy of Sciences Letter to Members, Winter, 1993.
3. Education reform from a national perspective: the mathematics community's investment and future, Notices of the American Mathematical Society, Oct., 1994, 921-926.
4. Welcoming Remarks, in Mathematical Preparation of the Technical Work Force, Report of a Workshop, Mathematical Sciences Education Board, National Research Council, National Academy Press, 1995.
5. Mathematicians as educators. In Notices of the American Mathematical Society, January 1997, pp. 18 - 21. (Previous versions include a presentation at the Board on Mathematical Sciences workshop, Actions for the Mathematical Sciences in the Changed Environment.)
6. Mathematicians and the national eighth grade test. Notices of the American Mathematical Society, 45 (2), 589-592.
7. The mathematics education debates. Paper presented at the semiannual meeting of the Governing Board of the Center for Mathematics, Science, and Engineering Education, February 1998; also at the Research Pre-session of the National Council of Teachers of Mathematics, Washington, D.C., April, 1998.
8. Algebra with integrity and reality. Keynote address at the NRC Symposium on the Nature and Role of Algebra in the K-14 Curriculum. Proceedings published by the NRC (1998).
9. Research on university-level mathematics education: (Some of) what is needed, and why. Plenary lecture at Workshop (in Singapore, December, 1998), of the International Commission on Mathematics Instruction, in preparation of a study volume on The teaching and learning of mathematics at the university level, to be published by Kluwer.
10. Mathematicians and the National Eighth-Grade Test. In Notices of the American Mathematical Society, May, 1998, pp. 589-593.
11. (w/ D. L. Ball). (2000). Interweaving content and pedagogy in teaching and learning to teach: Knowing and using mathematics. In J. Boaler (Ed.), Multiple perspectives on the teaching and learning of mathematics. (pp. 83-104). Westport, CT: Ablex.
12. (w/ D. L. Ball). (2000). Making believe: The collective construction of public mathematical knowledge in the elementary classroom. In D. Phillips (Ed.), Constructivism in education (100th Yearbook of the National Society for the Study of Education), (pp. 193-224). Chicago: University of Chicago Press.
13. (w/ D. L. Ball) (2000). Review of *The Number Devil* by Hans Magnus Enzensberger. Notices of the American Mathematical Society, 47 (1), 51-56.
14. (w/ D. L. Ball) (2003) Making mathematics reasonable in school. In G. Martin (Ed.), Research compendium for the Principles and Standards for School Mathematics. (pp. 3-14). Reston, VA: National Council of Teachers of Mathematics.
15. Computational fluency: One mathematician's perspective. The Mathematics Teacher, February, 2003.
16. "The Carnegie Initiative on the Doctorate: The Case of Mathematics." Carnegie Foundation for the Advancement of Teaching, (2003). Also published in the Notices of the American Mathematical Society, vol. 50, no. 7, August, 2003, 766-775.
17. (w. D. L. Ball) "Toward a practice-based theory of mathematical knowledge for teaching." In B. Davis & E. Simmt (Eds.), Proceedings of the 2002 Annual Meeting of the Canadian Mathematics Education Study Group, (pp. 3 -14). Edmonton, AB: CMESG/ GCEDM (2003).
18. (w/ D. L. Ball) "A practice-based theory of mathematical knowledge for teaching: The case of mathematical reasoning." Proceedings of the 2001 ICMI Workshop on Mathematics Education, East China Normal University, Shanghai, China (2003).
19. (w/ D. L. Ball). "Knowing mathematics for teaching." Invited plenary address; Proceedings of the international conference on "Preparation of Mathematics Teachers for the Future Education and Competence Development", Malmö, Sweden, May 5, 2003.

20. (w. B. Hodgson) "The International Commission on Mathematical Instruction. What? Why? For Whom?" In Notices of the American Mathematical Society, June/ July, 2004, pp 639-644.
21. "Mathematics, Mathematicians, and Mathematics Education," (2005). Bulletin of the American Mathematical Society, vol. 42, 417-430.
22. (w/ D. L. Ball, & H. C. Hill) "Knowing Mathematics for Teaching: Who knows mathematics well enough to teach third grade, and how can we decide?" In American Educator, Fall 2005
23. (w/ D. L. Ball and I.M. Goffney) "The Role of Mathematics Instruction in Building a Socially Just and Diverse Democracy" The Mathematics Educator (2005) 15(1), 2-6.