

Curriculum Vitae

Manuel Lerman

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Date of Appointment 1973

Birthdate: February 5, 1943
Birthplace: New York, New York

Education: B.S. 1964 City College of New York
Ph.D. 1968 Cornell University

Experience: 1968-70 Instructor, Massachusetts Institute of Technology
1970-73 Assistant Professor, Yale University
1973-76 Associate Professor, University of Connecticut
1976-2006 Professor, University of Connecticut
1975-76 Visiting Professor, University of Illinois at Chicago
2/81, 3/95 Visiting Professor, University of Chicago
1990 Fellow, Mathematical Sciences Research Institute, Berkeley
2006- Professor Emeritus, University of Connecticut

Professional Societies: American Mathematical Society
Association for Symbolic Logic
American Association of University Professors

Honors or Distinctions: Phi Beta Kappa
National Science Foundation Research Grants, 1970-95, 1995-98.
NSF Conference Grant, 1979.
AAUP Research Excellence Award, 1999.
Editor: Logic Year 1979-80: The University of Connecticut.
Editor: Computability Theory and Its Applications. Contemporary Math.
Managing Editor, Perspectives in Mathematical Logic Series,
Springer-Verlag, 1986-1998, Editor 1999-2000.
Editor: Bulletin for Symbolic Logic, 2001-2006.
Editor: Lecture Notes in Logic, 2010-
Invited Plenary Address, International Congress for Logic, Methodology
and the Philosophy of Science, Uppsala, Sweden, 1991.
Invited Plenary Addresses, Annual Meeting of the Association for
Symbolic Logic, 1979, 1989, 1997.
NSF Equipment Grant, 1986-88.
NSF Logic Seminar Grant, 1986-05.
U.S. - New Zealand Binational Research Grant, 1988-90,
Principal Investigator.
U.S. - Germany Binational Research Grant, 1991-97.
Program Chair, Annual Meeting of the Association
for Symbolic Logic, 1994.
Association for Symbolic Logic: Council Member, 1986-98,
Prize Committee Chair, 1996-2000.

Field of Specialization: Mathematical Logic
Research Interests: Computability Theory, Computable Model Theory

Ph.D. Students: Chi Tat Chong, National University of Singapore
Anne Leggett, Loyola University of Chicago
James Hefferon, St. Michael's College
Hong Ye, Microsoft
Zhiming Zou, Industry
Frank Weber, Industry
Burkhard Englert, UCLA

Publications

Books and Monographs

1. Lerman, M. 1983. Degrees of Unsolvability: Local and Global Theory, Perspectives in Mathematical Logic, Springer-Verlag Publishing Co., Berlin, Heidelberg, New York, 307 pps.
2. Lerman, M. 2010. A Framework for Priority Arguments, Lecture Notes in Logic, Cambridge University Press (Association for Symbolic Logic series), Cambridge, England, 176 pps.

Journal Articles

1. Lerman, M. 1969. Some nondistributive lattices as initial segments of the degrees of unsolvability, *J. Symbolic Logic*, 34:85-98.
2. Lerman, M. 1970. Recursive functions modulo co-r-maximal sets, *Trans. Amer. Math. Soc.* 148:429-44.
3. Lerman, M. 1970. Turing degrees and many-one degrees of maximal sets, *J. Symbolic Logic*, 35:29-40.
4. Lerman, M. 1971. Initial segments of the degrees of unsolvability, *Ann. Math.* 93:365-89.
5. Lerman, M. 1971. Some theorems on r-maximal sets and major subsets of recursively enumerable sets, *J. Symbolic Logic*, 36:193-215.
6. Lerman, M. 1972. On suborderings of the α -recursively enumerable α -degrees, *Ann. Math. Logic*, 4:369-92.
7. Lerman, M. and G. E. Sacks. 1972. Some minimal pairs of α -recursively enumerable degrees, *Ann. Math. Logic*, 4:415-42.
8. Lerman, M. and S. G. Simpson. 1973. Maximal sets in α -recursion theory, *Israel Journal Math.* 14:236-47.
9. Lerman, M. 1974. Maximal α -recursively enumerable sets, *Trans. Amer. Math. Soc.* 188:341-86.
10. Lerman, M. 1974. Least upper bounds for minimal pairs of α -recursively enumerable α -degrees, *J. Symbolic Logic*, 39:49-56.
11. Lerman, M. and C. T. Chong. 1976. Hyperhypersimple α -recursively enumerable sets, *Ann. Math. Logic*, 9:1-48.
12. Lerman, M. 1976. Congruence relations, ideals, filters and definability in lattices of α -recursively enumerable sets, *J. Symbolic Logic*, 41:405-18.
13. Lerman, M. 1976. Types of simple α -recursively enumerable sets, *J. Symbolic Logic*, 41:419-26.
14. Lerman, M. 1976. Ideals of generalized finite sets in lattices of α -recursively enumerable sets. *Zeitschrift für Math. Logik und Grund. der Math.* 22:347-52.
15. Lerman, M., R. A. Shore and R. I. Soare. 1978. R-maximal major subsets. *Israel J. Math.*, 31:1-18.
16. Lerman, M. 1978. On elementary theories of some lattices of α -recursively enumerable sets. *Ann. Math. Logic*, 14:227-272.
17. Lerman, M. and J. H. Schmerl. 1979. Theories with recursive models. *J. Symbolic Logic*, 44:59-76.
18. Lerman, M. and R. I. Soare. 1980. D-simple sets, small sets, and degree classes. *Pacific J. Math.* 87:135-55.
19. Lerman, M. and R. I. Soare. 1980. A decidable fragment of the elementary theory of the lattice of recursively enumerable sets. *Trans. Amer. Math. Soc.* 257:1-37.

20. Lerman, M., R. A. Shore, and R. I. Soare. 1984. The elementary theory of the lattice of r.e. degrees is not \aleph_0 -categorical. *Advances in Math.* 53:301-20.
21. Lerman, M. and J. Remmel. 1984. The universal splitting property, II. *J. Symbolic Logic*, 49:137-50.
22. Ambos-Spies, K. and M. Lerman. 1985. Lattice embeddings into the recursively enumerable degrees. *J. Symbolic Logic* 51:225-54.
23. Lerman, M., 1985. Upper bounds for the arithmetical degrees. *Ann. Pure and Applied Logic*, 29:225-54.
24. Lerman, M. 1986. Degrees which do not bound minimal degrees, *Ann. Pure and Applied Logic*, 30:249-76.
25. Lerman, M. and R. A. Shore. 1988. Decidability and invariant classes for degree structures. *Trans. Amer. Math. Soc.* 301(2): 669-92.
26. Ambos-Spies, K. and M. Lerman. 1989. Lattice embeddings into the recursively enumerable degrees, II: Embeddings. *J. Symbolic Logic* 54:735-60.
27. Jockusch, C.G. Jr., M. Lerman, R.I. Soare and R. Solovay. 1989. Recursively enumerable sets modulo iterated jumps and extensions of Arslanov's Completeness Criterion, *J. Symbolic Logic* 54:1288-1323.
28. Lerman, M. 1991. Minimal degrees and recursively inseparable pairs of recursively enumerable sets, *Zeitschrift Math. Logik Grund. Math.* 37:331-42.
29. Lempp, S. and M. Lerman. 1992. The existential theory of the poset of r.e. degrees with a predicate for single jump reducibility, *J. Symbolic Logic* 57:1120-30.
30. Ambos-Spies, K., S. Lempp and M. Lerman. 1994. Lattice embeddings into the r.e. degrees preserving 0 and 1, *J. London Math Soc.* 49:1-15.
31. Lempp, S. and M. Lerman. 1995. A general framework for priority arguments, *Bull. Symbolic Logic* 1:189-201.
32. Lempp, S. and M. Lerman. 1996. The decidability of the existential theory of the recursively enumerable degrees with jump relations, *Advances in Math.* 120:1-142.
33. Ambos-Spies, K., P. Fejer, S. Lempp and M. Lerman. 1996. The decidability of the two-quantifier theory of the recursively enumerable weak truth-table degrees and other distributive upper semi-lattices, *J. Symbolic Logic* 61:880-905.
34. Lempp, S. and M. Lerman. 1997. Iterated trees of strategies and priority arguments. *Archive for Math. Logic* 36:297-312.
35. Lempp, S. and M. Lerman. 1997. A finite lattice without critical triple that cannot be embedded into the enumerable Turing degrees, *Ann. Pure and Applied Logic*, 87:167-185.
36. Lerman, M. 1998. A necessary and sufficient condition for embedding ranked finite lattices into the computably enumerable Turing degrees, *Ann. Pure and Applied Logic*, 94:143-180.
37. Lerman, M. 2000. A necessary and sufficient condition for embedding principally decomposable finite lattices into the computably enumerable Turing degrees, *Ann. Pure and Applied Logic*, 101:275-297.
38. Calhoun, William C. and Manuel Lerman. 2001. Embedding finite lattices into the ideals of computably enumerable Turing degrees. *J. Symbolic Logic*, 66(2001), 1791–1802.
39. Englert, Burkard, Manuel Lerman and Kevin Wald. 2003. Homomorphisms and quotients of degree structures, *Ann. Pure and Applied Logic* 123(2003), 193–233.
40. Lerman, Manuel and Richard Watnick. 2003. Computable choice sets for computable linear orderings, *Math. Logic Quarterly* 49(2003), 485–510.
41. Binns, Stephen, Bjorn Kjos-Hanssen, Manuel Lerman and Reed Solomon. 2006. On a conjecture of Dobrinen and Simpson concerning almost everywhere domination, *J. Symbolic Logic* 71(2006), 119–136.
42. Binns, Stephen, Bjorn Kjos-Hanssen, Manuel Lerman, James Schmerl and Reed Solomon. 2008. Self-embeddings of computable trees, *Notre Dame J. Formal Logic* 49(2008),1–37.
43. Jockusch, Carl G. Jr., Bart Kastermans, Steffen Lempp, Manuel Lerman, and Reed Solomon, *Stability and Posets*, Accepted by *JSL* 7/2008.

Conference Proceedings

1. Lerman, M. 1973. Admissible ordinals and priority arguments. In: *Proc. Cambridge Summer School in Logic, 1971*. Springer-Verlag. Berlin, Heidelberg, New York. pp. 311-44.
2. Lerman, M. 1978. Lattices of α -recursively enumerable sets. In: *Generalized Recursion Theory II*. J. E. Fenstad et. al. eds. North-Holland Publishing Co. Amsterdam. pp. 223-38.

3. Lerman, M. 1978. The degrees of unsolvability: Some recent results. In: *Recursion Theory: Its Generalisations and Applications*. F. Drake et. al. eds. London Math. Soc. Lecture Notes Series 45. Cambridge University Press. Cambridge, England. pp. 140-57.
4. Lerman, M. 1981. On recursive linear orderings. In: *Logic Year 1979-80: The University of Connecticut*. M. Lerman et. al. eds. Lecture Notes in Mathematics 859. Springer-Verlag. Berlin, Heidelberg, New York. pp. 132-42.
5. Lerman, M. and J. Rosenstein. 1982. Recursive Linear Orderings, II. In: *Patras Logic Symposium*. G. Metakides ed. North-Holland Publishing Co. Amsterdam. pp. 123-36.
6. Lerman, M. and J. B. Remmel. 1982. The universal splitting property, I. In: *Logic Colloquium 1980*. D. van Dalen et. al. eds. North-Holland Publishing Co. Amsterdam. pp. 181-208.
7. Lerman, M. 1983. The structures of recursion theory. In: *Southeast Conference in Mathematical Logic*. C. T. Chong and M. Wicks, eds. Studies in Logic and the Foundations of Mathematics 111. North-Holland Publishing Co. Amsterdam, New York. pp. 77-95.
8. Lerman, M. 1985. The embedding problem for the recursively enumerable degrees. In: *Proceedings of the Symposium in Pure Mathematics 42*. Amer Math. Soc. Providence. pp. 13-20.
9. Lerman, M. 1985. On the ordering of classes in high/low hierarchies. In: *Recursion Theory Week*. H. D. Ebbinghaus G. H. Müller and G. E. Sacks eds. Lecture Notes in Mathematics 1141. Springer-Verlag. Berlin, Heidelberg, New York. pp. 260-270.
10. Lempp, S. and M. Lerman. 1991. Priority arguments using iterated trees of strategies, In: *Proceedings of the Oberwolfach Conference on Recursion Theory, 1989*. K. Ambos-Spies, G.H. Müller and G.E. Sacks, eds. Lecture Notes in Mathematics. Springer-Verlag. Berlin, Heidelberg, New York. pp. 277-96.
11. Lempp, S., M. Lerman, and F. Weber. 1993. Minimal pair constructions and iterated trees of strategies. In: *Logical Methods: In Honor of Anil Nerode's 60th Birthday*. J. Crossley, J. Remmel, R. Shore, and M. Sweedler, eds. Birkhäuser, Boston, Basel, Berlin. pp.512-524.
12. K. Ambos-Spies, S. Lempp and M. Lerman. 1994. Lattice embeddings into the r.e. degrees preserving 1. In: *Logic, Methodology and the Philosophy of Science IX*. D. Prawitz, B. Skyrms, and D. Westerståhl eds. Elsevier Science, Amsterdam, New York. pp. 179-198.
13. M. Lerman. 1996. Embeddings into the recursively enumerable degrees. In: *Computability, Enumerability, Decidability: Directions in Recursion Theory*, S.B. Cooper, T.A. Slaman, and S.S. Wainer, eds. London Math. Soc. Lecture Notes 224, Cambridge Univ. Press, Cambridge. pp. 185-204.
14. M. Lerman. 2000. Embeddings into the computably enumerable degrees. In: *Computability Theory and Its Applications*, P. A. Cholak, S. Lempp, M. Lerman and R. A. Shore eds. Contemporary Mathematics 257. American Math. Soc., Providence. 191–205.
15. S. Lempp, M. Lerman and D. R. Solomon. 2004. Embedding finite lattices into the computably enumerable degrees — a status survey. In: *Logic Colloquium '02*, Z. Chatzidakis, P. Koepke and W. Pohlers eds., Lecture Notes in Logic 27, Association for Symbolic Logic, Wellesley, MA, 2006.
16. Kach, Asher, Manuel Lerman and Reed Solomon. 2009. Cappable CEA sets and Ramsey's Theorem, In: *Proceedings of the 11th Asian Logic Conference, 2009*, T. Arai, Q. Feng, B. Kim, G. Wu and Y. Yang eds. World Scientific Pub. Co., Singapore, 2012.

Invited Addresses

1. The lattice of recursively enumerable sets, University of Connecticut Mathematics Colloquium, 1971.
2. Minimal pairs of α -recursively enumerable α -degrees, Cambridge Summer School in Logic, 1971.
3. The α -finite injury priority method, Amer. Math. Soc. Special Session on Recursion Theory, Milwaukee, 1971.
4. Maximal α -r.e. sets for uncountable admissible ordinals, M.I.T. Logic Seminar, 1972.
5. Maximal α -r.e. sets for uncountable admissible ordinals, Cornell Mathematics Colloquium, 1972.
6. Maximal sets and admissible ordinals, Amer. Math. Soc. Special Session on Recursion Theory, Dartmouth, 1972.
7. Algebraic structures in recursion theory, Mathematics Colloquium, University of Illinois at Chicago, 1975.
8. Congruence relations and definability in lattices of α -recursively enumerable sets, Amer. Math. Soc. Special Session on Recursion Theory, St. Louis, 1975.

9. On elementary theories of some lattices of α -r.e. sets, Amer. Math. Soc. Special Session on Recursion Theory, Toronto, 1976.
10. Recursive Model Theory, New aspects in Mathematical Logic, Oberwolfach, Germany, 1976.
11. Recursive Model Theory, Mathematics Colloquium, Pennsylvania State University, 1977.
12. Lattices of α -r.e. sets, Second International Conference on Generalized Recursion Theory, University of Oslo, Norway, 1977.
13. Degrees of unsolvability, Recent Aspects of Mathematical Logic, Yale University, 1977.
14. A survey of results in classical recursion theory, M.I.T. Logic Colloquium, 1977.
15. Initial segments of the degrees less than $\mathbf{0}'$, Amer. Math. Soc. Special Session on Applications of Logic to Mathematics, Providence, 1978.
16. Recursively enumerable degrees, M.I.T. Logic Colloquium, 1978.
17. Recent results on the degrees of unsolvability, Logic Colloquium '79, Leeds, England, 1979.
18. Recent results on the degrees of unsolvability, Invited Address, Annual Meeting of the Association for Symbolic Logic, New York, 1979.
19. Recent directions in recursion theory, Mathematics Colloquium, University of Miami, 1980.
20. Degrees of Unsolvability, Omega Group Meeting, Patras, Greece, 1980.
21. Recursive Linear Orderings, Amer. Math. Soc. Special Session on Recursion Theory, Kenosha, Wisc., 1980.
22. Recursive Linear Orderings, UCLA Logic Colloquium, 1981.
23. Recursive Linear Orderings, (Series of 2 talks), University of Chicago, 1981.
24. Initial segments of the degrees below $\mathbf{0}'$, (series of 2 talks), University of Chicago, 1981.
25. Splitting Theorems, Cornell logic Seminar, 1981.
26. Recursive Linear Orderings, Logic Seminar, Hebrew University, Jerusalem, 1981.
27. Recursion Theoretic Structures, First Southeast Asian Conference on Mathematical Logic, 1981.
28. Recursive Linear Orderings, Western Illinois University Mathematics Colloquium, Macomb, 1981.
29. The embedding problem for the recursively enumerable degrees, Cornell Summer Institute, 1982.
30. A jump away from $\mathbf{0}^{(\omega)}$, M.I.T. Harvard Logic Colloquium, 1982.
31. The degrees below $\mathbf{0}^{(\omega)}$, Second Biennial Logic Meeting, M.I.T., 1983.
32. High/Low Hierarchies, Mid-Atlantic Mathematical Logic Seminar, 1985.
33. Invariant classes for high/low hierarchies, University of Illinois Logic Seminar, 1985.
34. High/low hierarchies, Cornell University Logic Seminar, 1985.
35. Generalizations of the Recursion Theorem and Completeness Criteria, UCLA Logic Meeting, 1986.
36. Generalizations of the Recursion Theorem and Completeness Criteria, CUNY Logic Seminar, 1986.
37. $\mathbf{0}'''$ -priority arguments, M.I.T.-Harvard Logic Colloquium, 1986.
38. A game-theoretic approach to recursion theory, (10 lectures), Guizhou University, Guizhou, China, 1987.
39. Recent developments in recursion theory, Mathematics Colloquium, Beijing University, 1987.
40. Decidability, definability, and degree structures, Charles University Mathematics Colloquium, Prague, 1987.
41. Lattice embeddings into the recursively enumerable degrees, Logic Seminar, University of Wisconsin, 1988.
42. Higher-order priority arguments, M.I.T.-Harvard Logic Colloquium, 1988.
43. Minimal degrees and recursively inseparable pairs of recursively enumerable sets, AMS Special Session, Chicago, 1989.
44. Higher-order priority arguments, Invited address, Association for Symbolic Logic Annual Meeting, 1989.
45. Higher-order priority arguments, Logic Seminar, University of Heidelberg, 1989.
46. Embeddings into the recursively enumerable degrees (2 lectures), Recursion Theory Seminar, MSRI, 1990.
47. Recent results on the degrees of unsolvability, Mathematics Colloquium, Univ. of California at Santa Barbara, 1990.
48. The elementary theory of the recursively enumerable degrees with jump predicate, Recursion Theory Seminar, MSRI, 1990.
49. Embeddings into the recursively enumerable degrees preserving least and/or greatest element, M.I.T.-Harvard Logic Colloquium, 1991.

50. Lattice embeddings into the recursively enumerable degrees preserving least and/or greatest element, Invited Plenary Address, International Congress for Logic, Methodology and the Philosophy of Science, Uppsala, Sweden, 1991.
51. Priority arguments using iterated trees of strategies, University of Wisconsin Logic Seminar, 1992.
52. Iterated trees of strategies and constructions of minimal pairs of r.e. degrees, Symposium in honor of Anil Nerode's 60th birthday, Cornell University, 1992.
53. Priority arguments using iterated trees of strategies, Amer. Math. Soc. Special Session, Washington, D.C., 1993.
54. Priority arguments using iterated trees of strategies, Sacks Symposium, Massachusetts Institute of Technology, 1993.
55. An algebraic measure of the computational power of sets, Mathematics Colloquium, Villanova University, 1994.
56. The jump operator and the recursively enumerable degrees, Mid-Atlantic Mathematical Logic Seminar, University of Pennsylvania, 1994.
57. What is a priority argument?, M.I.T.-Harvard Logic Seminar, 1994.
58. A general framework for priority arguments, Conference on Recursion Theory, University of Leeds, England, 1994.
59. Using the framework for priority arguments, Logic Seminar, University of Leeds, Leeds, England, 1994.
60. Towards a decision procedure for the $\forall\exists$ -theory of the r.e. degrees, Logic Seminar, University of Wisconsin, 1995.
61. An algebraic measure of undecidability, and algorithms, Mathematics Colloquium, University of Notre Dame, 1995.
62. Towards a decision procedure for the $\forall\exists$ -theory of the r.e. degrees, Logic Colloquium, University of Chicago, 1995.
63. A general framework for priority arguments, Logic Colloquium, University of Chicago, 1995.
64. Towards a decision procedure for the $\forall\exists$ -theory of the r.e. degrees, M.I.T.-Harvard Logic Colloquium, 1995.
65. Towards a decision procedure for the $\forall\exists$ -theory of the r.e. degrees, Workshop Leader, Greater Boston Biennial Logic Conference, 1995.
66. A finite lattice without critical triple which cannot be embedded into the enumerable degrees, Logic Colloquium '96, Haifa, Israel, 1996.
67. A necessary and sufficient for embedding ranked finite lattices into the computably enumerable degrees, Computability Theory Week, Oberwolfach, Germany, 1996.
68. A necessary and sufficient for embedding ranked finite lattices into the computably enumerable degrees, Cornell University Logic Seminar, 1996.
69. A necessary and sufficient for embedding ranked finite lattices into the computably enumerable degrees, Plenary address, Annual Meeting, Association for Symbolic Logic, Cambridge, MA, 1997.
70. Lattice embeddings into the computably enumerable degrees, Special Session, Summer Meeting of the Association for Symbolic Logic, Leeds, England, 1997.
71. Priority arguments using iterated trees of strategies, Computability Theory Workshop, Kazan, Russia, 1997.
72. Embedding principally decomposable finite lattices into the computably enumerable degrees, Amer. Math. Soc. Special Session, Annual Meeting, Baltimore, MD, 1998.
73. The decidability of the existential theory of the Turing degrees with least element and jump, Assoc. for Symb. Logic Special Session, Annual Meeting, San Diego, CA, 1999.
74. Embeddings into the computably enumerable degrees, Joint. Math. Conference Summer Institute, Boulder, CO, June, 1999.
75. Homomorphisms and quotients of degree structures, Focus Lecture, Meeting of the Association for Symbolic Logic, Washington, DC, 2000.
76. Homomorphisms and quotients of degree structures, Computability Theory Week, Mathematics Research Institute, Oberwolfach, Germany, 2001.
77. Computable choice sets for computable linear orderings, Amer. Math. Soc. Special Session, Annual Meeting, San Diego, CA, 2002.

78. Computable choice sets for computable linear orderings, Logic Seminar, University of Wisconsin, 2002.
79. Computable choice sets for computable linear orderings, Amer. Math. Soc. Special Session, Annual Meeting, Baltimore, MD, 2003.
80. Homomorphisms and quotients of degree structures, 2003 Greater Boston Logic Meeting, Principal address.
81. The existential theory of the uppersemilattice of degrees with least element and jump is decidable, Special Session of the AMS, Evanston, IL, 2004.
82. Self-embeddings of computable trees, International Symposium on Computational Prospects of Infinity, Singapore, 2005.
83. The existential theory of the uppersemilattice of degrees with least element and jump is decidable, Conference in honor of Richard Shore's sixtieth birthday, MIT, 2007.
84. The existential theory of the uppersemilattice of degrees with least element and jump is decidable, Berkeley Logic Seminar, 2007.
85. The existential theory of the uppersemilattice of degrees with least element and jump is decidable, CUNY Logic Seminar, 2007.
86. Measuring Computational Information Content, Mathematics Colloquium, East Carolina University, 4/2007.
87. Gert Muller, Perspectives, Degrees of Unsolvability, Meeting in Memory of Gert Muller, University of Heidelberg, Germany, 6/2007.
88. Cappable CEA Sets and Ramsey's Theorem, Eleventh Asian Logic Conference, Singapore, 2009.