Curriculum Vitae
Martin Davis

Born	New York City	1928	
Education:	City College of New York	BS	1948
	Princeton University	MA	1949
	Princeton University	PhD	1950
Positions:	New York University Professor of Mathematics (1965-1969) (1969–) Chair of Computer Science (1988–1990) (1996–) Emeritus	Joint appointment with Computer Science	1965– 1988
	Associate Professor and Professor Belfer Graduate School of Science Yeshiva University		1960–65
	Research Scientist and Adjunct Associate Professor of Mathematics New York University		1959–60
	Assistant Professor and Professor of Mathematics Hartford Graduate Division Rensselaer Polytechnic Institute		1956–59
	Assistant Professor of Mathematics Ohio State University		1955–56
	Assistant Professor of Mathematics University of California–Davis		1954–55
	Visiting Member School of Mathematics Institute for Advanced Study		1952–54
	Research Instructor in Mathematics University of Illinois		1950–52
Visiting Appointments:	Westfield College University of London, England		1968–69
	Belfer Graduate School of Science Yeshiva University		1970–71
	University of California Santa Barbara		1978–79
	Mills College Oakland		Spring 1997

Honors and Awards:

Leroy P. Steele Prize, American Mathematical Society, January 1975.
Chauvenet Prize, Mathematical Association of America, January 1975.
Lester R. Ford Prize, Mathematical Assoc. of America, January 1975.
Earle Raymond Hedrick Lecturer 1976, Mathematical Association of America.
Fellow of the A.A.A.S., January 1982.
Guggenheim Foundation Fellowship, 1983–84.
Elected to Gamma Chapter, Phi Beta Kappa, 1995.
Townsend Harris medal, 2001.

Consulting Positions:

Bell Telephone Laboratories, Murray Hill, N.J.
Applied Logic Inc., Princeton, N.J.
IBM Research Laboratories, Yorktown Heights, N.Y.
Rand Corporation, Santa Monica, California.
Microsoft Corporation, Redmond, Washington.

Professional Service:

Editorial Boards:

Journal of Symbolic Logic
Journal of the Association for Computing Machinery
Journal of Automated Reasoning

Served on *MAA* award committees for *Chauvenet Prize and Hedrick Lecturer*
Served on *American Mathematical Society Nominations Committee*
Served on *Nominations Committee, Section A, A.A.A.S*
Chairman, *Nominations Committee, Association for Symbolic Logic*
Chairman, *Committee on Academic Freedom, Tenure, and Employment Security of the American Mathematical Society*
Wrote section on "Theoretical Computer Science" for "Outlook for Science and Technology - The Next Five Years," 1982, prepared by the National Research Council for the Congress of the United States.
Served on Program Committee of *Fifth Conference on Automated Deduction*; Local Arrangements Chairman for *Sixth Conference on Automated Deduction*.
Chairman of committee to select first winner of prize for a "landmark" contribution to automatic theorem proving.
Member of Program Committee for 1989 meeting on "Logic in Computer Science."
American Mathematical Society representative to AAAS Section T (Information, Computing and Communication)

Invited Presentations at Professional Conferences:

- "Applications of Recursive Function Theory to Number Theory," *Symposium on Recursive Function Theory, American Mathematical Society*, New York, April 1961.
- "Eliminating the Irrelevant from Mechanical Proofs," *Symposium on Experimental Arithmetic, American Mathematical Society*, April 1962.
- "Unsolvable Problems," *Symposium on Mathematical Theory of Automata*, New York, April 1962.
- "First Order, Second Order, and Higher Order Logic," *Association for Symbolic Logic*, Washington, D.C., December 1963.
- "Diophantine Equations and Recursive Sets," and "Recursive Functions - An Introduction," *NATO Advanced Study Institute on Automata*, Ravello, Italy, June 1964.
- "Computability," *Symposium on System Theory*, New York 1965.
- "One Equation to Rule Them All," *New York Academy of Science*, March 1968.
- "Hilbert's Tenth Problem," *London Mathematical Society*, London, England, March 1969.
- "Speed-up Theorems and Diophantine Equations," *Courant Computer Science Symposium on Computational Complexity*, New York, October 1971.
- "The Unsolvabilty of Hilbert's Tenth Problem," *Joint meeting of American Mathematical Society and Association for Symbolic Logic*, St. Louis, March 1972.

- "Three Lectures on Some Mathematical Applications of Logic: I. Unsolvable Problems; II. Diophantine Sets; III. Nonstandard

  Analysis," *Earle Raymond Hedrick Lectures, Mathematical Association of America*, Toronto, August 1976.

- "Takeuti Models and the Foundations of Quantum Mechanics," *Symposium on Infinitesimals*, Iowa City, May 1977.

- "Boolean-Valued Models in Set Theory, Analysis, and Quantum Mechanics," *Chauvenet Symposium, Mathematical Association of America*, Atlanta, January 1978.

- "What is a Computation," *Symposium on Mathematics Today, American Association for the Advancement of Science*, Houston, January 1979.

- "The Prehistory and Early History of Automated Deduction," *Fourth Workshop on Automated Deduction*, Austin, February 1979.

- "Why Didn't Gödel Have Church's Thesis?" *Recursion Theoretic Aspects of Computer Science*, Purdue University, May 1981. "Diophantine Representation of Arithmetic Propositions," *New York Academy of Sciences*, March 1982.

- "Formal Proof and Mathematical Practice," *Symposium on New Kinds of Mathematical Proof (with Hilary Putnam, K.I. Appel, Stephen Cook, Marvin Minsky, and Marshall Stone), American Philosophical Association*, Philadelphia, April 1982.

- "Logic and Computation," *Symposium on Philosophy of Computation*, Brown University, November 1982.

- "Relations between Mathematical Logic and Computer Science," *Symposium on Mathematical Logic, Research Institute of Mathematical Sciences*, University of Kyoto, Japan, October 1983.

- "Teaching the Incompleteness Theorem," *Panel Discussion on Teaching of Logic, Logic Colloquium '88*, Padua, Italy, August 1988.

- "Trends in Logic: Relations with Computer Science," *Panel Discussion on Trends in Logic, Logic Colloquium '88*, Padua, Italy, August 1988.

- "Emil Post: His Life and Work," *The Legacy of Emil Post*, City College, New York, November 1988.

- "Emil Post's Contributions to Computer Science," *Logic in Computer Science*, Asilomar, California, June 1989.

- "In Defense of First order Logic," *International Symposium on Artificial Intelligence and Mathematics*, Fort Lauderdale, Florida, January 1990.

- "American Logic in the Twenties," *Symposium honoring John Shepherdson*, Bristol, England, March 1992.

- "Kurt Gödel, Computer Scientist," *Kurt Gödel Gesellschaft*, Brno, Czech Republic, August 1993.

- "Leibniz's Dream," *NY Academy of Science*, December 1994

- "Why Foundations Are Important," *American Mathematical Society,* Philadelphia, April 1998.

- "Gödel's Legacy," *Association for Symbolic Logic,* Urbana, Illinois, April 2000.

- "Computability in the Twentieth Century," *Logic Colloquium 2000,* Paris, July 2000.

- "Aspects of Universality," *Machines, Computations and Universality 2001,* Chisinau, May 2001.

Doctoral Dissertations Supervised:

1. Eric Wagner, "Uniformly Reflexive Structures: Towards an Abstract Theory of Computability," Columbia University, 1963.

2. Robert DiPaola, "On Pseudo-Complements of Recusively Enumerable Sets," Yeshiva University, 1964.
3. Donald Loveland, "Recusively Random Sequences," New York University, 1964.
4. Robert Case, "Partial Predicates," Yeshiva University, 1966.
5. Martin Zuckerman, "Finite Versions of the Axiom of Choice," Yeshiva University, 1967.
6. Saul Levy, "Computational Equivalence," Yeshiva University, 1970.
7. John Denes (now called John Grant), "Definable Automorphisms in Model Theory," New York University, 1970.
8. Richard Gostanian, "The Next Admissable Ordinal," New York University, 1971.
9. Donald Perlis, "Ackermann's Set Theory and Related Topics," New York University, 1972.
10. Daniel Gogol, "Models of Formulas in Various Languages," Yeshiva University, 1973.
11. Keith Harrow, "Sub-Elementary Classes of Functions and Relations," New York University, 1973.
12. William Gewirtz, "Investiations in the Theory of Descriptive Complexity," New York University, 1974.
13. Edward Schwartz, "Existential Definability in Terms of Some Quadratic Functions," Yeshiva University, 1974.
14. Barry Jacobs, "α Computational Complexity," New York University, 1975.
15. Richard Rosenberg, "Recusively Enumerable Images of Arithemtic Sets," New York University, 1976.
16. Jean-Pierre Keller, "Abstract Forcing and Applications," New York University, 1977.
17. Allen Goldberg, "On the Complexity of the Satisfiability Relation," New York University, 1979.
18. Moshe Koppel, "Bases of Recursively Enumerable Relations," New York University, 1980.
19. Ron Sigal, "Undecidable Complexity Statements in a Hierarchy of Extenstions of Primitive Recursive Arithmetic," New York University, 1983.
20. Elia Weixelbaum, "Formal Languages with Oracles," New York University, 1983.
21. Eugenio Omodeo, "Decidability and Proof Procedures for Set Theory with a Choice Operator," New York University, 1984.
22. Alberto Policriti, "On a Generalization of Herbrand's Theorem," New York University, 1990.
23. Ronald Fechter, "Skolem Functions, Hilbert's ϵ-Symbol, and the Lambda Calculus," New York University, 1991.
24. Thomas Emerson, "Computation over Abstract Ordered Rings: Rings of Computable Functions, NP-Completeness, and Relativized Complexity Classes," New York University, 1995.

Publications

1. "On the Theory of Recursive Unsolvability," Doctoral Dissertation, Princeton University, May 1950.
2. "Arithmetical Problems and Recursively Enumerable Predicates," *Journal of Symbolic Logic,* vol. 18(1953), pp. 33-41.
3. "A Note on Universal Turing Machines," *Automata Studies*, C.E. Shannon and J. McCarthy, editors, Annals of Mathematics Studies, Princeton University Press, 1956.
4. "The Definition of Universal Turing Machine," *Proceedings of the American Mathematical Society,* vol.8(1957), pp. 1125-1126.
5. *Computability and Unsolvability,* McGraw-Hill, New York 1958; reprinted with an additional appendix, Dover 1983.

6. (with Hilary Putnam) "Reductions of Hilbert's Tenth Problem," *Journal of Symbolic Logic,* vol.23(1958), pp. 183-187.

7. "A Program for Presburger's Algorithm," Summaries of Talks Presented at the Summer Institute for Symbolic Logic, Cornell University, 1957, Institute for Defense Analyses, 1960, pp. 215-223; reprinted in, Siekmann, Jörg and Graham Wrightson (eds), *Automation of Reasoning, vol. 1,* Springer Verlag, 1983, pp. 41-48.

8. "Computable Functionals of Arbitrary Finite Type," Summaries of Talks Presented at the Summer Institute for Symbolic Logic, Cornell University, 1957, Institute for Defense Analyses, 1960, pp. 242-246.

9. (with Hilary Putnam) "A Computing Procedure for Quantification Theory," *Journal of the Association for Computing Machinery,* vol.7(1960), pp. 201-215; reprinted in, Siekmann, Jörg and Graham Wrightson (eds), *Automation of Reasoning, vol. 1,* Springer Verlag, 1983, pp. 125-139.

10. (with Hilary Putnam and Julia Robinson) "The Decision Problem for Exponential Diophantine Equations," *Annals of Mathematics,* vol.74(1961), pp. 425-436.

11. "Aspects of Mechanical Theorem-Proving," *Proceedings of Third International Congress on Cybernetics,* Namur, Belgium, 1961, pp. 415-418.

12. (with George Logemann and Donald Loveland) "A Machine Program for Theorem Proving," *Communications of the Association for Computing Machinery,* vol.5(1962), pp. 394-397; reprinted in, Siekmann, Jörg and Graham Wrightson (eds), *Automation of Reasoning, vol. 1,* Springer Verlag, 1983, pp. 267-270.

13. "Unsolvable Problems: A Review," *Proceedings of the Symposium on Mathematical Theory of Automata,* 1962, pp. 15-22.

14. "Applications of Recursive Function Theory to Number Theory," *Proceedings of Symposia in Pure Mathematics,* vol. 5(1962), pp. 135-138.

15. (with Hilary Putnam) "Diophantine Sets over Polynomial Rings," *Illinois Journal of Mathematics,* vol.7(1963), pp. 251-255.

16. "Extensions and Corollaries of Recent Work on Hilbert's Tenth Problem," *Illinois Journal of Mathematics,* vol.7(1963), pp. 246-250.

17. "Eliminating the Irrelevant from Mechanical Proofs," *Proceedings of Symposia in Applied Mathematics,* vol.15(1963), pp. 15-30. reprinted in, Siekmann, Jörg and Graham Wrightson (eds), *Automation of Reasoning, vol. 1,* Springer Verlag, 1983, pp. 315-330.

18. (editor) *The Undecidable,* Raven Press 1965.

19. "Recursive Functions - An Introduction," *Automata Theory,* E.R. Caianello, editor, Academic Press,1966, pp. 153-163.

20. "Diophantine Equations and Recursively Enumerable Sets," *Automata Theory,* E.R. Caianello, editor, Academic Press,1966, pp. 146-152.

21. "Computability," *Proceedings of the Symposium on System Theory,* Brooklyn, N.Y. 1966, pp. 127-131.

22. *Lectures on Modern Mathematics,* Gordon and Breach, 1967.

23. *First Course in Functional Analysis,* Gordon and Breach, 1967.

24. "Recursive Function Theory," *Encyclopedia of Philosophy,* Paul Edwards, editor, Macmillan and Free Press, 1967, vol.7, pp. 89-95.

25. "One Equation to Rule Them All," *Transactions of the New York Academy of Sciences,* Sec. II, vol.30(1968), pp. 766-773.

26. "An Explicit Diophantine Definition of the Exponential Function," *Communications on Pure and Applied Mathematics,* vol.24(1971), pp. 137-145.

27. (with Reuben Hersh) "Nonstandard Analysis," *Scientific American,* vol.226(1972), pp. 78-86.

28. "On the Number of Solutions of Diophantine Equations," *Proceedings of the American Mathematical Society,* vol.35(1972), pp. 552-554.

29. "Hilbert's Tenth Problem is Unsolvable," *American Mathematical Monthly,* vol.80(1973), pp. 233-269; reprinted in Davis, Martin, *Computability and Unsolvability,* Dover 1983.

30. (with Reuben Hersh) "Hilbert's Tenth Problem," *Scientific American,* vol.229(1973), pp. 84-91; reprinted in Abbott, J.C. (ed.) *The Chauvenet Papers,* vol. 2, pp. 555-571, Math. Assoc. America, 1978.

31. "Speed-up Theorems and Diophantine Equations," *Computational Complexity,* Randall Rustin, editor, Algorithmics Press, 1973, pp. 87-95.

32. (with Yuri Matijasevic and Julia Robinson) "Hilbert's Tenth Problem: Diophantine Equations: Positive Aspects of a Negative Solution," *Proceedings of Symposia in Pure Mathematics,* vol.28(1976), pp. 323-378; reprinted in Feferman, Solomon, ed. *The Collected Works of Julia Robinson,* Amer. Math. Soc. 1996, pp.269-378.

33. *Applied Nonstandard Analysis,* Interscience-Wiley, 1977.

34. "Unsolvable Problems," *Handbook of Mathematical Logic,* Jon Barwise, editor, North-Holland, 1977, pp. 567-594.

35. "A Relativity Principle in Quantum Mechanics," *International Journal of Theoretical Physics,* vol.16(1977), pp. 867-874.

36. "What is a Computation?" *Mathematics Today: Twelve Informal Essays,* L. A. Steen, editor, Springer-Verlag, 1978, pp. 241-267.

37. (with J.T. Schwartz) "Metamathematical Extensibility for Theorem Verifiers and Proof-Checkers," *Computers and Mathematics with Applications,* vol.5(1979), pp. 217-230.

38. "Notes on the Mathematics of Non-Monotonic Reasoning," *Artificial Intelligence,* vol.13(1980), pp. 73-80.

39. "Obvious Logical Inferences," *Proceedings of the Seventh Joint International Congress on Artificial Intelligence,* 1981, pp. 530-531.

40. (with Elaine J. Weyuker) "Pseudo-Oracles for Non-Testable Programs," ACM '81 Conference Proceedings, pp. 254-257.

41. "Why Gödel Didn't Have Church's Thesis," *Information and Control,* vol.54 (1982), pp. 3-24.

42. "Lectures at 'Atlanta State'," *Annals of the History of Mathematics,* vol.4(1982), pp. 370-371.

43. "The Prehistory and Early History of Automated Deduction," Siekmann, Jörg and Graham Wrightson (eds), *Automation of Reasoning, vol. 1,* Springer Verlag, 1983, pp. 1-28.

44. (with Elaine J. Weyuker) *Computability, Complexity, and Languages,* Academic Press, 1983.

45. (with Elaine J. Weyuker) "A Formal Notion of Program-Based Test Data Adequacy," *Information and Control,* vol.56(1983), pp. 52-71.

46. "Church's Thesis," *Encyclopedia of Artificial Intelligence,* John Wiley, 1987.

47. "Mathematical Logic and the Origin of Modern Computers," *Studies in the History of Mathematics,* pp. 137-165. Mathematical Association of America, 1987. Reprinted in *The Universal Turing Machine - A Half-Century Survey,* Rolf Herken, editor, pp. 149-174. Verlag Kemmerer & Unverzagt, Hamburg, Berlin 1988; Oxford University Press, 1988.

48. (with Elaine J. Weyuker) "Metric Space Based Test Data Adequacy Criteria," *The Computer Journal,* vol. 31(1988), pp. 17-24.

49. "Influences of Mathematical Logic on Computer Science," in *The Universal Turing Machine - A Half-Century Survey,* Rolf Herken, editor, pp. 315-326. Verlag Kemmerer & Unverzagt, Hamburg, Berlin 1988; Oxford University Press, 1988.

50. "Trends in Logic: Relations with Computer Science," *Logic Colloquium '88,* pp. 357-359, Elsevier 1989.

51. "Teaching the Incompleteness Theorem," *Logic Colloquium '88,* pp. 385-392, Elsevier 1989.

52. "Emil Post's Contributions to Computer Science," *Proceedings Fourth Annual Symposium on Logic in Computer Science,* pp. 134 - 136, IEEE Computer Society Press, Washington, D.C.,1989.

53. "Is Mathematical Insight Algorithmic?" Commentary on Roger Penrose, *The Emperor's New Mind,* in *Behavioral and Brain Sciences,* vol. 13 (1990), pp. 659-660.

54. Review of: Kurt Gödel, *Collected Works, vol. I*, Oxford University Press, in *Journal of Symbolic Logic,* vol. 55(1990), pp. 340-348.

55. Review of: Epstein and Carnielli, *Computability; (computable functions, logic, and the foundations of mathematics),* Wadsworth & Brooks/Cole 1989, in: Bull. Amer. Math. Soc. vol. 25(1991), pp. 106-111.

56. (with Ronald Fechter) "A Free Variable Version of the First-Order Predicate Calculus," Journal of Logic and Computation, vol. 1(1991), pp. 431-451.

57. "How Subtle is Gödel's Theorem? More on Roger Penrose," *Behavioral and Brain Sciences,* vol. 16(1993), pp. 611-612.

58. "First Order Logic," *Handbook of Logic in Artificial Intelligence and Logic Programming, vol. I Logical Foundations,* Gabbay, Hogger, Robinson, eds., Oxford 1993, pp. 31-65.

59. "Forward," *Hilbert's Tenth Problem*, by Yuri Matiyasevich, MIT Press 1993, pp. xiii-xvii.

60. (with Ron Sigal & Elaine J. Weyuker) *Computability, Complexity, and Languages,* second edition, Academic Press, 1994.

61. *Solvability, Provability, Definability: The Collected Works of Emil L. Post,* edited by Martin Davis and including the article: "Emil L. Post: His Life and Work," pp. xi-xxviii, Birkhäuser 1994.

62. "American Logic in the 1920s," *Bulletin of Symbolic Logic,* vol. 1 (1995), pp. 273-278.

63. *The Universal Computer: The Road from Leibniz to Turing,* W.W. Norton, 2000.

64. *Engines of Logic: Mathematicians and the Origin of the Computer* W.W. Norton, 2001. [paperpack edition of *The Universal Computer*]

65. "The Early History of Automated Deduction," *Handbook of Automated Reasoning, vol.I*, Robinson, Voronkov, eds., Elsevier, Amsterdam 2001, pp.3-15.