

Curriculum Vitae

Phokion G. Kolaitis
Computer Science Principles and Methodologies
IBM Almaden Research Center
650 Harry Road
San Jose, CA 95120, USA
kolaitis@almaden.ibm.com

Positions

- 2004– Senior Manager, Computer Science Principles and Methodologies, IBM Almaden Research Center, San Jose.
- 2001–02 Academic Visitor, Foundations of Computer Science, IBM Almaden Research Center, San Jose (on sabbatical leave from UC Santa Cruz)
- 1997–01 Chair, Computer Science Department, UC Santa Cruz
- 1994– Professor of Computer Science, UC Santa Cruz
- 1993–94 Visiting Associate Professor, Computer Science Department, Stanford University (supported by a Guggenheim Fellowship and a sabbatical leave from UC Santa Cruz)
- 1990–94 Associate Professor of Computer Science, UC Santa Cruz
- 1988–90 Assistant Professor of Computer Science, UC Santa Cruz
- 1987–88 Visiting Associate Professor, Computer Science Department, Stanford University
- 1986–87 Visiting Scientist, Foundations of Computer Science, IBM Almaden Research Center, San Jose
- 1981–86 Assistant Professor of Mathematics, Occidental College, Los Angeles (promoted to Associate Professor and granted tenure in April 1986)
- 1984–85 Visiting Assistant Professor, Dept. of Mathematics, University of California, Los Angeles (partially supported by a J.D. MacArthur Research Professorship from Occidental College)
- 1979–81 L.E. Dickson Instructor, Department of Mathematics, The University of Chicago

Education

- Diploma in Mathematics, University of Athens, Greece, 1973.
- M.A. in Mathematics, University of California, Los Angeles, 1974.
- Ph.D. in Mathematics, University of California, Los Angeles, 1978.

Research Interests

Logic in Computer Science, Database Theory, Computational Complexity

Awards

Fellow of the Association of Computing Machinery (ACM), elected in 2005.

IBM Research Division Outstanding Innovation Award for *Foundations of Schema Mappings* (joint work with R. Fagin and L. Popa), 2005.

IBM Research Division 2004 Pat Goldberg Memorial Best Paper Award in Computer Science, Engineering, and Mathematics for the paper *Composing Schema Mappings: Second-Order Dependencies to the Rescue* (co-authored with R. Fagin, L. Popa, and W.-C. Tan).

Excellence in Teaching Award, awarded by the graduating computer science and computer engineering majors of UC Santa Cruz, 1995.

Guggenheim Fellowship, awarded by the John Simon Guggenheim Memorial Foundation, 1993-94.

The joint work with M.Y. Vardi on 0-1 laws for fragments of second-order logic earned an IBM Research Division Outstanding Innovation Award in 1992.

Other Honors

Invited Participant, Special Programme on Logic and Algorithms, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, February-March 2006.

Invited Professor, LIX Laboratory, Ecole Polytechnique, Paris, France, February 2003.

Invited Participant, 2000-01 Program on Mathematical Logic, Institut Mittag-Leffler, The Swedish Royal Academy of Sciences, Sweden, April 2001.

Invited Professor, University of Nancy and LORIA (French National Institute for Research in Computer Science and Control), Nancy, France, June-July 1993 and July 1997.

Extramural Grants (past ten years)

2004-07 Principal Investigator, IIS-0430994 “Metadata Model Management: Schema Mappings and Data Exchange” (co-PI: Professor W.-C. Tan), NSF Grant No. IIS-0430994, \$759,722.

2000-04 Principal Investigator, “Constraint Satisfaction and Database Query Evaluation”, NSF Grant No. IIS-9907419, \$188,388.

1998-01 Principal Investigator, “Automated Deduction and Computational Complexity”, NSF Grant No. CCR-9732041, \$182,982

1997-00 Principal Investigator, “Aspects of Computation Theory and Logic”, NSF Grant No. CCR-9610257, \$248,999.

Current Editorial Board Service

Managing Editor, *Annals of Pure and Applied Logic*, 1997 to present.

Associate Editor, *ACM Transactions on Database Systems*, 2005 to present.

Editorial Board Member, *Journal of Logic and Computation*, 1991 to present.

Editorial Board Member, *Theory of Computing Systems*, 2001 to present.

Editorial Board Member, *Bulletin of Symbolic Logic*, 2002 to present.

Editorial Board Member, *International Journal of Foundations of Computer Science*, 2002 to present.

Service to the Profession (past ten years)

General Chair, ACM Symposium on Principles of Database Systems (PODS), June 2006 to present.

General Chair, IEEE Symposium on Logic in Computer Science (LICS), July 2003 to August 2006.

Program Committee Chair, 18th Annual IEEE Symposium on Logic in Computer Science (LICS 2003).

Program Committee Chair, 21st Annual ACM Symposium on Principles of Database Systems (PODS 2002).

Scientific Committee Chair, 2nd Panhellenic Logic Symposium, Delphi, Greece, 1999.

Program Committee Co-Chair, 6th International Conference on Database Theory (ICDT '97).

Program Committee Member, 11th International Conference on Database Theory (ICDT 2007).

Program Committee Member, 17th Annual IEEE Symposium on Logic in Computer Science (LICS 2002).

Steering Committee Member, North American Summer School on Logic, Language and Information, 2002 to present.

Program Committee Member, 20th Annual ACM Symposium on Principles of Database Systems (PODS 2001).

Program Committee Member, 16th Annual ACM Symposium on Principles of Database Systems (PODS 1997).

Recent Invited Presentations

2006 “Data Exchange”, Invited Short Course, Bertinoro Ph.D. School on Data and Service Integration (DASI '06), Bertinoro, Italy, December 2006.

“Constraint Satisfaction and Logic”, Invited Tutorial, Workshop on Mathematics of Constraint Satisfaction: Algebra, Logic and Graph Theory, Isaac Newton Institute Satellite Workshop at the University of Oxford, Special Programme on Logic and Algorithms, Oxford, UK, March 2006.

“Foundations of Schema Mappings”, Invited Tutorial, Workshop on Logic and Databases, Special Programme on Logic and Algorithms, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, March 2006.

2005 “Constraint Satisfaction, Complexity, and Logic”, Invited Tutorial, Logic Colloquium 2005, Association for Symbolic Logic European Summer Meeting, Athens, Greece, August 2005.

“Inductive Definability and Finite-Variable Logics: From Logic to Computer Science”, Invited Talk, Fifth Panhellenic Logic Symposium (PLS 2005), Athens, Greece, July 2005.

Keynote Speaker, 24th Annual ACM Symposium on Principles of Database Systems (PODS 2005), Baltimore, Maryland, June 2005.

Invited Talk, Logic Colloquium, University of California, Los Angeles, May 2005.

“Constraint Satisfaction, Databases, and Logic”, Invited Short Course, Computer Science Department, University of Rome “La Sapienza”, Italy, April 2005.

2004 Invited Speaker, Workshop on Logic and Computational Complexity, Turku, Finland, July 2004.

Invited Speaker, Third Hellenic Conference on Artificial Intelligence (SETN '04), Samos, Greece, May 2004.

- Invited Talk, Logic Colloquium, University of California, Berkeley, April 2004.
- 2003 Invited Speaker, CISE Distinguished Lecture Series, National Science Foundation, December 2003.
- Invited Speaker, Distinguished Lecture Series, Computer Science Department, University of Toronto, November 2003.
- Invited Speaker, Eighteenth International Joint Conference on Artificial Intelligence (IJCAI 2003), Acapulco, Mexico, August 2003.
- Invited Speaker, 2003 Annual Meeting of the Association for Symbolic Logic, Chicago, June 2003.
- Principal Speaker, 15th McGill Invitational Workshop on Computational Complexity, Bellairs Research Institute of McGill University, St. James, Barbados, March 2003.
- 2002 Invited Speaker, 2nd International Workshop on Complexity in Automated Deduction, 2002 Federated Logic Conference (FloC 2002), Copenhagen, Denmark, July 2002.
- Invited Lecturer, Advanced course on “Constraint Satisfaction, Complexity, and Logic”, 1st North American Summer School on Logic, Language and Information (NASSLLI ’02), Stanford University, June 2002.
- Invited Speaker, Symposium on the Effectiveness of Logic in Computer Science (ELICS02), Max Planck Institute for Computer Science (MPI), Saarbrücken, Germany, March 2002.
- 2001 Invited Speaker, 6th International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR ’01), Vienna, Austria, September 17–19, 2001.
- 2000 Invited Speaker, Ninth CSLI Workshop on Logic, Language and Computation (LLC 9), Stanford University, May 2000.
- Invited Speaker, Symposium in Honor of the 80th Birthday of Roland Fraïssé, Mathematics Institute of Luminy, Marseille, France, May 2000.
- 1999 Invited Speaker, Meeting on Finite Model Theory, Databases and Computer-Aided Verification, International Conference and Research Center for Computer Science, Schloss Dagstuhl, Germany, October 1999.
- Invited Speaker, Workshop on Complexity-theoretic and Recursion-theoretic Methods in Databases, Artificial Intelligence and Finite Model Theory, Federated Logic Conference (FLoC ’99), Trento, Italy, June 1999.
- Invited Speaker, Workshop on Implicit Computational Complexity, Federated Logic Conference (FLoC ’99), Trento, Italy, June 1999.
- Invited Speaker, Workshop on Complexity in Automated Deduction, LORIA, Nancy, France, June 1999.
- Invited Tutorial Speaker “Finite Model Theory: Expressiveness of Logics”, Tutorial and Workshop on Logic and Cognitive Science, Institute for Research in Cognitive Science (IRCS), University of Pennsylvania, April 1999.
- Invited Speaker, Special Session in Model Theory, 1999 Annual Meeting of the Association for Symbolic Logic, San Diego, March 1999.
- Invited Panelist, Symposium on “The Unusual Effectiveness of Logic in Computer Science”, 1999 Annual Meeting of the American Association for the Advancement of Science, Anaheim, January 1999.

Postdoctoral Scholars Sponsored

- 2000-01 Dr. Victor Dalmau, Polytechnic University of Catalonia (UPC), Spain; visited UC Santa Cruz from September 2000 to December 2001 supported by a NSF Grant.
- 1997-98 Dr. Martin Otto, Technical University of Aachen, Germany; visited UC Santa Cruz during the entire academic year 1997-98, supported by a grant from DFG (German Science Foundation).
- 1995-96 Dr. Martin Grohe, University of Freiburg, Germany; visited UC Santa Cruz during the entire academic year 1995-96, supported by a postdoctoral fellowship from DAAD (German Academic Exchange Service).
- 1995-96 Dr. Kerkko Luosto, University of Helsinki, Finland; visited UC Santa Cruz from September 1995 to February 1996, supported by a grant from the Academy of Finland.
- 1994-95 Dr. Miki Hermann, INRIA-Lorraine, France; visited UC Santa Cruz during the entire academic year 1994-95, supported by a NATO postdoctoral fellowship.

Ph.D Theses Supervised

- | | | |
|------|-------------------|---|
| 2006 | J. Panttaja | “Complexity in Databases, Games, and Logic” |
| 2004 | Delbert D. Bailey | “Structural Phase Transitions of Boolean Satisfiability Variants” |
| 2002 | Albert Atserias | “Fixed-Point Logics, Descriptive Complexity, and Random Satisfiability” |
| 1996 | Ian Barland | “Expressing Optimization Problems as Integer Programs, and Undirected Path Problems: a Descriptive Complexity Approach” |
| 1993 | Madhukar Thakur | “Descriptive Complexity of Optimization and Counting Problems” |

M.S. Theses and Projects Supervised

- | | | |
|------|---------------------|---|
| 2001 | Delbert D. Bailey | “Phase Transitions in Counting-Threshold SAT Problems” |
| 2001 | Jonathan Panttaja | “On the Complexity of Existential k -Pebble Games” |
| 2001 | Lisa Meteyer | “Quantification in SQL Database Query Language” |
| 2000 | Thomas Raffill | “On the Search for a Phase Transition in AC-Matching” |
| 1999 | Albert Atserias | “Computational Aspects of First-Order Logic on Finite Structures” |
| 1998 | Raymond Wheeler | “On the Complexity of AC-Unification” |
| 1990 | Madhavan Thirumalai | “Circumscription: A Formalism of Nonmonotonic Reasoning” |

Patents Filed

- “Sequential Composition of XML Schema Mappings”, filed as Docket ARC920050087US1, January 18, 2006; co-inventors: R. Fagin, L. Popa, W.-C. Tan, C. Yu.
- “System and Method for Performing a High-Level Multi-Dimensional Query on a Multi-Structural Database”, filed as Docket ARC920050060US1, June 13, 2005; co-inventors: R. Fagin, R. Guha, R. Kumar, J. Novak, D. Sivakumar, and A. Tomkins.

Books Edited

- *Proceedings of the 2nd Panhellenic Logic Symposium*, Ph. Kolaitis and G. Koletsos (Eds.), National Technical University of Athens, 1999.
- *Database Theory - ICDT '97, Proceedings of the 6th International Conference on Database Theory*, F. Afrati and Ph. Kolaitis (Eds.), Lecture Notes in Computer Science 1186, Springer-Verlag, 1997.
- *Descriptive Complexity and Finite Models*, N. Immerman and Ph. Kolaitis (Eds.), DIMACS Series in Discrete Mathematics and Theoretical Computer Science, volume 31, American Mathematical Society, 1997.

Special Issues Edited

- Selections from the *18th IEEE Annual Symposium on Logic in Computer Science (LICS 2003)*, Ph.G. Kolaitis (Ed.), *ACM Transactions on Computational Logic*, 6(4), October 2005, pp. 674–842.
- Selections from the *6th International Conference on Database Theory, (ICDT '97)*, F. Afrati and Ph.G. Kolaitis (Eds.), *Theoretical Computer Science*, Vol. 239, No. 2, May 2000, pp. 187–338.

Chapters in Book

- “The Expressive Power of Logics on Finite Models” in “Finite Model Theory and its Applications”, EATCS Series: Texts in Theoretical Computer Science, Springer, 2007, pp. 37–124.
- “A Logical Approach to Constraint Satisfaction” (with M.Y. Vardi) in “Finite Model Theory and its Applications”, EATCS Series: Texts in Theoretical Computer Science, Springer, 2007, pp. 339–371.

Articles in Journals and Conference Proceedings

- “Peer data exchange” (with A. Fuxman, R.J. Miller, and W.-C. Tan), *ACM Transactions on Database Systems*, 31 (4), December 2006, pp. 1454–1498. Invited paper from PODS 2005; preliminary version in *Proceedings of the Twenty-Fourth ACM Symposium on Principles of Database Systems (PODS 2005)*, pp. 160–171.
- “The connectivity of Boolean satisfiability: computational and structural dichotomies” (with P. Gopalan, E. Maneva, and C.H. Papadimitriou), *Proceedings of 33rd International Colloquium on Automata, Languages and Programming (ICALP 2006)*, LNCS 4051, Springer, 2006, pp. 346–357.
- “The containment problem for real conjunctive queries with inequalities” (with T.S. Jayram and E. Vee), *Proceedings of the 25th ACM Symposium on Principles of Database Systems (PODS 2006)*, pp. 80–89, 2006.
- “The complexity of data exchange” (with J. Panttaja and W.-C. Tan), *Proceedings of the 25th ACM Symposium on Principles of Database Systems (PODS 2006)*, pp. 30–39, 2006.
- “On preservations under homomorphisms and unions of conjunctive queries” (with A. Atserias and A. Dawar), *Journal of the Association for Computing Machinery*, 52 (3), March 2006, pp. 208–237. Invited paper from PODS 2004; earlier version in *Proceedings of the Twenty-Third ACM Symposium on Principles of Database Systems (PODS 2004)*, pp. 319–329.
- “Composing schema mappings: second-order dependencies to the rescue” (with R. Fagin, L. Popa, and W.-C.Tan), *ACM Transactions on Database Systems*, 30 (4), December 2005, pp. 994–1055. Invited paper from PODS 2004; earlier version in *Proceedings of the Twenty-Third ACM Symposium on Principles of Database Systems (PODS 2004)*, pp. 83–94.
- “Schema Mappings, Data Exchange, and Metadata Management”, Invited Paper, *Proceedings of the Twenty-Fourth ACM Symposium on Principles of Database Systems (PODS 2005)*, pp. 61–75.
- “Data exchange: semantics and query answering” (with R. Fagin, R.J. Miller, and L. Popa), *Theoretical Computer Science*, 336, 2005, pp. 89–124. Special issues with selections from the 9th International Conference on Database Theory - ICDT 2003; preliminary version in *Proceedings of the 9th International Conference on Database Theory (ICDT 2003)*, LNCS Series, Volume 2572, Springer, 2003, pp. 207–224.
- “Data exchange: getting to the core” (with R. Fagin and L. Popa), *ACM Transactions on Database Systems*, 30 (1), March 2005, pp. 174–210. Invited paper from PODS 2003; earlier version in *Proceedings of the Twenty-Second ACM Symposium on Principles of Database Systems (PODS 2003)*, pp. 90–101.

- “Efficient implementation of large-scale, multi-structural databases” (with R. Fagin, R. Kumar, J. Novak, D. Sivakumar, and A. Tomkins), *Proceedings of the 2005 Conference on Very Large Databases (VLDB 2005)*, pp. 958–969.
- “Exchange, integration, and consistency of data: Report on the ARISE/NISR Workshop” (with L.E. Bertossi, J. Chomicki, P. Godfrey, A. Thomo, and C. Zuzarte), *SIGMOD Record*, 34 (7), 2005, pp. 87–90.
- “Subtractive reductions and complete problems for counting complexity classes” (with A. Durand and M. Hermann), *Theoretical Computer Science*, 340, 2005, pp. 496–513. Invited paper from MFCS 2000; preliminary version in *Proceedings of 25th International Symposium on Foundations of Computer Science (MFCS 2000)*, LNCS 1893, Springer, 2000, pp. 323–332.
- “Existential second-order logic over graphs: charting the tractability frontier” (with T. Schwentick and G. Gottlob), *Journal of the Association for Computing Machinery*, Volume 51, Number 2, 2004, pp. 312–362 (preliminary version in: *Proceedings of 41st Annual IEEE Symposium on Foundations of Computer Science (FOCS 2000)*, pp. 664–674, October 2000.)
- “A dichotomy in the complexity of propositional circumscription” (with L.M. Kirousis), *Theory of Computing Systems*, 37 (6), pp. 695–715, 2004. Preliminary version in *Proceedings of the Sixteenth Annual IEEE Symposium on Logic in Computer Science (LICS 2001)*, pp. 71–80, June 2001.
- “On the complexity of existential pebble games” (with J. Panttaja), *Proceedings of Computer Science Logic CSL 2003*, Lecture Notes in Computer Science 2803, Springer 2003, pp. 314–329.
- “Constraint satisfaction, databases, and logic”, Invited paper, *Proceedings of the Eighteenth International Joint Conference on Artificial Intelligence (IJCAI 2003)*, pp. 1587–1595.
- “Phase transitions of bounded satisfiability problems” (with D. D. Bailey), *Proceedings of the Eighteenth International Joint Conference on Artificial Intelligence (IJCAI 2003)*, pp. 1187–1193.
- “The complexity of minimal satisfiability problems” (with L.M. Kirousis), *Information and Computation*, Volume 187, Number 1, pp. 20–39, 2003. Preliminary version in *Proceedings of 18th International Symposium on Theoretical Aspects of Computer Science (STACS 2001)*, Lecture Notes in Computer Science, vol. 2010, pages 407–418, 2001.
- “Constraint satisfaction, bounded treewidth, and finite-variable logics” (with M.Y. Vardi and V. Dalmau), *Proceedings of the Eighth International Conference on Principles and Practice of Constraint Programming (CP 2002)*, Lecture Notes in Computer Science Series, Vol. 2470, Springer, 2002, pp. 311–326.
- “Comparing phase transitions and peak cost in PP-complete satisfiability problems” (with D.D. Bailey and V. Dalmau), *Proceedings of the Eighteenth Conference on Artificial Intelligence (AAAI ’02)*, AAAI Press/The MIT Press, 2002, pp. 620–626. Invited for presentation in a plenary session of AAAI ’02.
- “In search of a phase transition in the AC-matching problem” (with T. Raffill), *Proceedings of the Seventh International Conference on Principles and Practice of Constraint Programming (CP 2001)*, Lecture Notes in Computer Science Series, Vol. 2239, Springer, 2001, pp. 433–450.
- “On the complexity of model checking and inference in minimal models” (with L.M. Kirousis), Invited Paper, *Proceedings of the 6th International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR ’01)*, Lecture Notes in Artificial Intelligence Series, Vol. 2173, Springer, 2001, pp. 42–53.

- “Phase transitions of PP-complete satisfiability problems” (with D.D. Bailey and V. Dalmau), *Proceedings of the Seventeenth International Joint Conference on Artificial Intelligence (IJCAI 2001)*, pages 183–189. Preliminary report in: *Proceedings of the Workshop on Theory and Applications of Satisfiability Testing - SAT 2001*, pp. 144–150. Full version invited to a special issue of *Discrete Applied Mathematics*.
- “On the unusual effectiveness of logic in computer science” (with J.Y. Halpern, R. Harper, N. Immerman, M.Y. Vardi, V. Vianu), *Bulletin of Symbolic Logic*, 7:2(2001), pp. 213–236.
- “0-1 Laws for fragments of existential second-order logic: a survey” (with M.Y. Vardi), Invited Paper, *Proceedings of 25th International Symposium on Foundations of Computer Science (MFCS 2000)*, Lecture Notes in Computer Science, Vol. 1893, Springer-Verlag, 2000, pp. 84–98.
- “A game-theoretic approach to constraint satisfaction” (with M.Y. Vardi), *Proceedings of the Seventeenth National Conference on Artificial Intelligence (AAAI 2000)*, AAAI Press/The MIT Press, 2000, pp. 175–181.
- “Conjunctive-query containment and constraint satisfaction” (with M.Y. Vardi), *Journal of Computer and System Sciences*, 61, 2000, pp. 302–332. Special issue with selections from the 17th ACM Symposium on Principles of Database Systems - PODS ’98; preliminary version in *Proceedings of the Seventeenth ACM Symposium on Principles of Database Systems (PODS ’98)*, Seattle, Washington, 1998, pp. 205–213.
- “Unification algorithms cannot be combined in polynomial time” (with M. Hermann), *Information and Computation*, vol. 162, no. 1-2, 2000, pp. 24–42. Special issue with selections from the Proceedings of the 13th International Conference on Automated Deduction; preliminary version in *Proceedings of 13th International Conference on Automated Deduction (CADE-13)*, Lecture Notes in Computer Science (subseries LNAI), Vol. 1104, Springer-Verlag, 1996, pp. 246–260.
- “On the complexity of counting the Hilbert basis of a linear Diophantine system” (with M. Hermann and L. Juban), *Proceedings of 6th International Conference on Logic for Programming and Automated Reasoning (LPAR ’99)*, Lecture Notes in Artificial Intelligence, Vol. 1705, Springer-Verlag, 1999, pp. 13–33.
- “Computational complexity of simultaneous elementary matching problems” (with M. Hermann), *Journal of Automated Reasoning*, Vol. 23, No. 2, August 1999, pp. 107–136. Preliminary version in: *Proceedings of 20th International Symposium on Mathematical Foundations of Computer Science (MFCS ’95)*, Lecture Notes in Computer Science, Vol. 969, Springer-Verlag 1995, pp. 359–70.
- “First-order logic vs. fixed-point logic in finite set theory” (with A. Atserias), *Proceedings of the Fourteenth Annual IEEE Symposium on Logic in Computer Science (LICS ’99)*, Trento, Italy, 1999, pp. 275–284.
- “Integer programming as a framework for optimization and approximability” (with I. Barland and M.N. Thakur), *Journal of Computer and System Sciences*, Oct. 1998, vol.57, no. 2), pp. 144–161 (*Special issue: Selections from the Eleventh Annual IEEE Conference on Computational Complexity*). Preliminary version in: *Proceedings of Eleventh Annual IEEE Conference on Computational Complexity* 1996, pp. 249–59.
- “On the boundedness problem for two-variable first-order logic” (with M. Otto), *Proceedings of Thirteenth Annual IEEE Symposium on Logic in Computer Science (LICS ’98)*, Indianapolis, Indiana, 1998, pp. 513–524.
- “On the complexity of the containment problem for conjunctive queries with built-in predicates” (with D.L. Martin and M.N. Thakur), *Proceedings of the Seventeenth ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS ’98)*, Seattle, Washington, 1998, pp. 197–204.

- “On the complexity of unification and disunification in commutative idempotent semigroups”, *Proceedings of Third International Conference on Principles and Practice of Constraint Programming* (CP 1997), *Lecture Notes in Computer Science*, Vol. 1330, Springer-Verlag, 1997, pp. 282–296.
- “Can Datalog be approximated?” (with S. Chaudhuri), *Journal of Computer and System Sciences*, Oct. 1997, vol. 55, no. 2, pp. 355–369 (*Special issue: Selections from the Thirteenth ACM Symposium on Principles of Database Systems*). Preliminary version in: *Proceedings of the Thirteenth ACM Symposium on Principles of Database Systems* (PODS ’94), Minneapolis, Minnesota, 1994, pp. 86–96.
- “Infinitary logic in finite model theory” (invited paper), *Logic and Scientific Methods: Volume One of the Tenth International Congress of Logic, Methodology and Philosophy of Science*, ed. by Maria Luisa Dalla Chiara et al., Kluwer Academic Publishers, 1997, pp. 107–125.
- “How to define a linear order on finite models” (with L. Hella and K. Luosto), *Annals of Pure and Applied Logic*, Oct. 1997, vol.87, no. 3, pp. 241–67 (*Special issue: Selections from the 9th Annual IEEE Symposium on Logic in Computer Science*). Preliminary version in: *Proceedings of 9th Annual IEEE Symposium on Logic in Computer Science* (LICS ’94), Paris, France, 1994, pp. 40–49.
- “On the decision problem for two-variable first-order logic” (with E. Grädel and M.Y. Vardi), *The Bulletin of Symbolic Logic*, Volume 3, Number 1, March 1997, pp. 53–69.
- “Almost everywhere equivalence of logics in finite model theory” (with L. Hella and K. Luosto), *The Bulletin of Symbolic Logic*, Volume 2, Number 4, December 1996, pp. 422–443.
- “On the expressive power of variable-confined logics” (with M.Y. Vardi), *Proceedings of 11th Annual IEEE Symposium on Logic in Computer Science* (LICS ’96), 1996, pp. 348–359.
- “The complexity of counting problems in equational matching” (with M. Hermann), *Journal of Symbolic Computation*, 1995, vol.20, (no.3), pp. 343–62. Preliminary version in: *Proceedings of 12th International Conference on Automated Deduction* (CADE-12), *Lecture Notes in Computer Science* (subseries LNAI) 814, Springer-Verlag, 1994, pp. 560–74.
- “Implicit definability and infinitary logic in finite model theory” (with A. Dawar and L. Hella), *Proceedings 22nd International Colloquium on Automata, Languages, and Programming* (ICALP ’95), *Lecture Notes in Computer Science*, Vol. 944, Springer-Verlag 1995, pp. 624–635.
- “Generalized quantifiers and pebble games on finite structures” (with J. K. Väänänen), *Annals of Pure and Applied Logic*, 1995, vol.74, (no.1), pp. 23–75. Preliminary version in: *Proceedings of Seventh Annual IEEE Symposium on Logic in Computer Science* (LICS 92), Santa Cruz, California, 1992, pp. 348–359.
- “On the expressive power of Datalog: Tools and a case study” (with M.Y. Vardi), *Journal of Computer and System Sciences*, 1995, vol.51, (no.1) pp. 110–34 (*Special issue: Selections from the Ninth Annual ACM Symposium on Principles of Database Systems*). Preliminary version in: *Proceedings Ninth Annual ACM Symposium on Principles of Database Systems* (PODS 1990), Nashville, Tennessee, 1990, pp. 61–71.
- “Approximation properties of NP-minimization classes” (with M.N. Thakur), *Journal of Computer and System Sciences*, 1995, vol.50, (no.3), pp. 391–411 (*Special issue: Selections from the Sixth Annual IEEE Conference on Structure in Complexity*). Preliminary version in: *Proceedings Sixth Annual IEEE Conference on Structure in Complexity Theory*, Chicago, Illinois, 1991, pp. 353–366.
- “Logical definability of NP optimization problems” (with M.N. Thakur), *Information and Computation*, 1994, vol.115, (no.2), pp. 321–53.
- “Polynomial-time optimization, parallel approximation, and fixpoint logic” (with M.N. Thakur), in *Proceedings of Eighth Annual IEEE Conference on Structure in Complexity Theory*, pp. 31–41.

- “Infinitary logic for computer science” (with M.Y. Vardi), *Proceedings 19th International Colloquium on Automata, Languages, and Programming* (ICALP '92 - invited paper), Lecture Notes in Computer Science, Vol. 623, Springer-Verlag 1992, pp. 450–473.
- “Fixpoint logic vs. infinitary logic in finite-model theory” (with M.Y. Vardi), *Proceedings of Seventh Annual IEEE Symposium on Logic in Computer Science* (LICS 92), Santa Cruz, California, 1992, pp. 46–57.
- “Infinitary logic and 0-1 laws” (with M.Y. Vardi), *Information and Computation*, Volume 98, June 1992, pp. 258–294 (*Special issue*: Selections from the Fifth Annual IEEE Symposium on Logic in Computer Science). Preliminary version in: *Proceedings of Fifth IEEE Annual Symposium on Logic in Computer Science* (LICS 90), Philadelphia, Pennsylvania, 1990, pp. 156–167.
- “0-1 laws for fragments of second-order logic: an overview” (with M.Y. Vardi), *Logic from Computer Science*, Mathematical Sciences Research Institute Publications 21, Springer-Verlag 1991, pp. 265–286.
- “Why not negation by fixpoint?” (with C.H. Papadimitriou), *Journal of Computer and System Sciences*, August 1991, V43 N1, pp. 125–144 (*Special issue*: Selections from the Seventh Annual ACM Symposium on Principles of Database Systems). Preliminary version in: *Proceedings of the Seventh Annual ACM Symposium on Principles of Database Systems* (PODS 1988), Austin, Texas, 1988, pp. 231–239.
- “The expressive power of stratified logic programs”, *Information and Computation*, Volume 90, Number 1, January 1991, pp. 50–66.
- “Implicit definability on finite structures and unambiguous computations”, *Proceedings of Fifth IEEE Annual Conference on Logic in Computer Science* (LICS 90), Philadelphia, Pennsylvania, 1990, pp. 168–180.
- “0-1 laws and decision problems for fragments of second-order logic” (with M. Y. Vardi), *Information and Computation* Volume 87, Numbers 1/2, July/August 1990, pp. 302–338 (*Special issue*: Selections from the Third IEEE Annual Symposium on Logic in Computer Science). Preliminary version in: *Proceedings of the Third IEEE Annual Symposium on Logic in Computer Science* (LICS 1988), Edinburgh, Scotland, 1988, pp. 2–11.
- “Some computational aspects of circumscription” (with C.H. Papadimitriou), *Journal of the Association for Computing Machinery*, vol. 37, No 1, January 1990, pp. 1–14. Preliminary version in: *Proceedings of Seventh National Conference on Artificial Intelligence* (AAAI 88), Saint Paul, Minnesota, 1988, Vol. 2, pp. 465–469.
- “The decision problem for the probabilities of higher-order properties” (with M.Y. Vardi), *Proceedings of the Nineteenth Annual ACM Symposium on Theory of Computing*, (STOC 1987), New York, 1987, pp. 425–435.
- “ K_{l+1} -free graphs: asymptotic structure and a 0-1 law” (with H.-J. Prömel and B.L. Rothschild), *Transactions of the American Mathematical Society*, Volume 303, Number 2, 1987, pp. 637–671.
- “Asymptotic enumeration and a 0-1 law for m -clique free graphs” (with H.-J. Prömel and B.L. Rothschild), *Bulletin of the American Mathematical Society*, Volume 13, Number 2, 1985, pp. 160–162.
- “On asymptotic probabilities of inductive queries and their decision problem”, *Proceedings of Logics of Programs '85*, ed. by R. Parikh, Lecture Notes in Computer Science, Vol. 193, Springer-Verlag 1985, pp. 153–166.
- “Game Quantification”, *Model Theoretic Logics*, ed. by J. Barwise and S. Feferman, Perspectives in Mathematical Logic, Springer-Verlag 1985, pp. 365–421.

- “Canonical forms and hierarchies in generalized recursion theory”, *Recursion Theory*, Proceedings of Symposia in Pure Mathematics, Volume 42, American Mathematical Society 1985, pp. 139-170.
- “Model theoretic characterizations in generalized recursion theory”, *Logic Year 1979-80, The University of Connecticut*, ed. by M. Lerman, J.H. Schmerl and R.I. Soare, Lecture Notes in Mathematics, Vol. 859, Springer-Verlag 1981, pp. 104-119.
- “Recursion and nonmonotone induction a quantifier”, *The Kleene Symposium*, ed. by J. Barwise, H.J. Keisler and K. Kunen, North-Holland 1980, pp. 367-389.
- “Recursion in a quantifier vs. elementary induction”, *Journal of Symbolic Logic* 44 (1979), pp. 235-259.
- “On recursion in E and semi-Spector classes”, *Cabal Seminar 1976-77*, ed. by A.S. Kechris and Y.N. Moschovakis, Lecture Notes in Mathematics, Vol. 689, Springer-Verlag 1978, pp. 209-243.