

# CURRICULUM VITAE

## Jouko Antero Väänänen

Department of Mathematics and Statistics  
P.O.Box 68 (Gustav Hällströminkatu 2)  
00014 University of Helsinki, FINLAND

Tunturikatu 12 A 9, 00100 Helsinki, Finland

Mobile: +358-40-513-8278  
jouko.vaananen@helsinki.fi  
<http://mathstat.helsinki.fi/logic/people/jouko.vaananen/>

### Personal data

- Born 3 September 1950 in Rovaniemi, Finland, citizen of Finland, Married

### Research topics

- Set theory, foundations of mathematics, logic in computer science, semantics of natural language
- Emphasis on generalized quantifiers, infinitary languages, model theory, games

### Degrees

- University of Manchester, England, Doctor of Philosophy, 15 December 1977, Mathematics, Supervisor: Peter Aczel
- University of Helsinki, Finland, Master of Science, 2 February 1973, Mathematics

### Positions

- University of Helsinki, Department of Mathematics and Statistics
  - Chairman of the department 1999-2000, 2004-2006
  - Professor, Foundations of Mathematics 1998-
  - Associate professor, Foundations of Mathematics 1983-1998
  - Assistant 1978-1983
  - Teaching assistant 1971- 1973
- University of Amsterdam, Institute for Logic, Language and Computation
  - Professor, Foundations of Mathematics 2006-
- Academy of Finland
  - Senior scientist 88-89,90,91-92,92-93,96-97,00-01

- Younger researcher 1981-1983

## Positions of trust

- Member of the Senate (Konsistori) (the highest decision making body of the university, chaired by the rector and consisting of 5 professors, 4 members of other staff, 4 students, and one outside member), 2004-2006
- Vice-dean, Faculty of Science, 2008-
- Member of the Board of the Faculty of Science 2001-2006, deputy member 2008-
- Chairman of the Board of the Department of Mathematics and Statistics 2004-2006
- Treasurer, European Mathematical Society, 2007-
- Chairman, Association for Symbolic Logic Committee for Logic in Europe, 2007-

## Major research grants

- Research grant since 1988
- Research grant of Academy of Finland, University of Helsinki and NSF, 1992-1994
- Research grant of Academy of Finland, University of Helsinki, 1995-1997
- Research grant of Academy of Finland, 1998-2003
- Research grant of University of Helsinki, 2000-2002
- Research grant of Academy of Finland 2005-2011
- ESF Eurocores LogiCCC grant 2008-2011
- ESF Research Networking Programme 2009-2014

## Software projects

- Openmath development, 1997-1999, Funding from TEKES, National Technology Agency of Finland, director.
- MAMMA, Interactive web-based teaching material based on Openmath, 2001-2002, Funding from the Ministry of Education and UH Faculty of Science, director.
- LOGAMES Project, a Java program that plays Ehrenfeucht-Fraïssé games on given graphs, 2001-2002, funding from the Academy of Finland, director.
- WebALT, Web Advanced Learning Technologies, EU eContent project, 2005-2006, funding from European Union, deputy co-ordinator.

## Invited talks 2006-2009

- MAMLS, Mid-Atlantic Mathematical Logic Seminar, Menachem Magidor 60th birthday meeting at UC Irvine, USA, February 2006
- American Institute of Mathematics, Workshop on Classification theory for abstract elementary classes, Palo Alto, July 2006
- Deutsche Mathematiker-Vereinigung Jahrestagung, Bonn, September 2006

- British Logic Colloquium, Oxford, September 2006
- HIIT, Helsinki, 2006
- Logical Workshop Logic & Games, Kazimierz Dolny, invited speaker, September 2006
- Lorentz Center, University of Leiden, Games, action and social software, Leiden, October 2006
- New Perspectives on Game and Interaction, Academy Colloquium, 5-7.2.2007, KNAW, Amsterdam
- LCD'07 : Workshop on Logics and Collective Decision-Making, March, 2007
- IBM Almaden Research Center, May 2007
- Interpolations: A conference in honor of William Craig, May, 2007, Berkeley, USA
- 50 Years of Generalized Quantifiers, Warsaw, June 2007
- IPM Logic Conference, June, 2007, Tehran Iran.
- Stanford logic seminar, May 2007, Stanford, USA
- GLoRi-Class, Amsterdam, October, 2007
- Core Logic Seminar, Amsterdam, November, 2007
- Calcutta University Conference, Kolkata, India, December 2007
- Calcutta Logic Circle, Kolkata, India, December 2007
- Rabindranath Tagore University, Shantiniketan, India, December 2007
- Young Set Theorist Workshop, January 2008, Bonn, Germany
- Departmental Colloquium, Utrecht, January, 2008
- Department of Mathematics, February 2008, Leeds University, UK
- Advances in Set-Theoretic Topology, Erice, Italy, June, 2008
- MATHLOGAPS Training Workshop, Manchester, July, 2008
- ESSLLI 2008, Hamburg, August, 2008
- Games 2008 Workshop, Warsaw, September, 2008
- Luminy Set Theory Workshop, Marseilles, September, 2008
- Mathematical Methods in Philosophy, Bristol, September, 2008
- ESF LogiCCC Kick-off Workshop, Prague, October, 2008.
- Helsinki University of Technology-TKK, Helsinki, November, 2008
- AMS/ASL joint mathematics meeting, Washington DC, January, 2009, Special ASL Lecture.
- LINT workshop, Amsterdam, January 2009
- From Plato to predicativity - Seminar on the Philosophy of Mathematics, Amsterdam, March 2009
- Summamutikkaklubi, Helsinki, March 2009
- DESDA symposium on mathematics and philosophy, Nijmegen, May 2009.
- Mathematical Logic in the Netherlands, Nijmegen, May 2009
- Philosophy and Foundations of Mathematics (Martin-Löf Retirement Colloquium), May 2009
- Logic Colloquium 2009, Sofia, plenary speaker.
- LORI II, Chongqing, China, October 2009
- GASICS, Aachen, October, 2009

## Selected recent memberships

- Member of the Executive Committee of the European Mathematical Society 2007-
- Member of the Executive Committee, Association for Symbolic Logic, 2007-
- Member of the Council of the Association for Symbolic Logic 1999-2001
- Member of the Committee of Logic in Europe of the Association for Symbolic Logic 2004-, Chair 2007-
- Chair of the Second European Set Theory Workshop, Bedlewo, 2009
- Chairman of the Organizing Committee for the European Summer Meeting of the Association for Symbolic Logic (Logic Colloquium) 2003
- Member of the Program Committee for the European Summer Meeting of the Association for Symbolic Logic (Logic Colloquium) 1990, 2003, 2006, plenary speaker 2001, 2009
- Chairman of the Nomination Committee of the Association for Symbolic Logic 2004
- Chairman of the Board of the Rolf Nevanlinna Research Foundation 2003-2005

## Ph.D. students

1. Maaret Karttunen 1984, "Model theory for infinitely deep languages"
2. Lauri Hella 1988, "Definability hierarchies of generalized quantifiers"
3. Heikki Tuuri 1990, "Infinitary languages and Ehrenfeucht-Fraïssé games"
4. Taneli Huuskonen 1991, "Comparing notions of similarity for uncountable models"
5. Kerkko Luosto 1992, "Filters in abstract model theory"
6. Jyrki Akkanen 1995, "Absolute logics"
7. Juha Nurmonen 1996, "Unary quantifiers and finite structures"
8. Aapo Halko 1996, "Negligible subsets of the generalized Baire space  $\omega_1^{\omega_1}$ "
9. Risto Kaila 2001, "On almost sure elimination of generalized quantifiers"
10. Alex Hellsten 2003, "Diamonds on large cardinals"
11. Juha Kontinen 2004, "Definability of second order generalized quantifiers"
12. Marta García-Matos 2005, "Abstract model theory without negation"
13. Matti Pauna 2007, "On Games on Non-Wellfounded Sets and Stationary Sets"
14. Ryan Bissell-Siders 2008, "On linear order and computation"
15. Ville Nurmi 2009, "Dependence Logic: Investigations into Higher-Order Semantics Defined on Teams"

## Major visits

(3 months or more)

- Department of Mathematics, University of California at Los Angeles, 1988-1989, 1 year, visiting scholar, hosted by Yiannis Moschovakis.
- Department of Mathematics, Simon Fraser University, Vancouver, 1990, 4 months, visiting professor, hosted by Alan Mekler.

- Computer and Information Sciences, University of California at Santa Cruz, 1991-1992, 6 months, research associate, hosted by Phokion Kolaitis.
- Department of Mathematics, Stanford University, 1991-1992, 6 months, visiting scholar, hosted by Solomon Feferman.
- Department of Mathematics, Simon Fraser University, Vancouver, 1992-1993, 8 months, visiting professor, hosted by Alistair Lachlan.
- Department of Mathematics, University of Freiburg, 1995, 3 months, hosted by Heinz-Dieter Ebbinghaus.
- Department of Mathematics, Florida State University, Tallahassee, 1996-1997, 5 months, visiting professor, hosted by Mika Seppälä.
- L'Equipe de Logique Mathématique, Paris VII, 1997, 3 months, hosted by Boban Velickovic.
- Mittag-Leffler Institute of the Royal Swedish Academy of Science, Stockholm, Sweden, 2000-2001, 9 months, scientific director (with Per Martin-Löf, Dag Norman and Viggo Stoltenberg-Hansen) of the Special Year of Logic.
- Mittag-Leffler Institute of the Royal Swedish Academy of Science, Stockholm, Sweden, 2009, 4 months, scientific director (with Hugh Woodin, Dag Norman and Erik Palmgren) of the Special Semester of Set Theory and Set Theoretic Model Theory.

## Short visits 2006-2009

(1 to 4 months)

- Princeton University Philosophy Department, July-August 2004, July 2006, hosted by John Burgess.
- Isaac Newton Institute for Mathematical Sciences Program on Logic and Algorithms, Cambridge, UK, April 2006

## Honors

- Elected to the Finnish Academy of Science and Letters, 2002
- Teaching Technology Award of the University of Helsinki 1999
- August Ramsay Award of the University of Helsinki 1982
- Ernst Lindelöf Award of the Finnish Mathematical Society 1973
- Pro Gradu Award of the Faculty of Science, University of Helsinki, 1973

## Editorial board member

- Notre Dame Journal of Formal Logic
- Logica Universalis

# List of publications

## Jouko Väänänen

Those marked with \* are published in unrefereed forums.

### Model theory

1. \*Äärettömät formaalikieliet ja abstraktit logiikat. In S. Miettinen, Logiikan perusteet II, pages 126-164, Oy Gaudeamus Ab, Helsinki, 1974.
2. \*Remarks on free quantifier variables, In J.Hintikka, I.Niiniluoto and E.Saarinen, editors, Essays on mathematical and philosophical logic pages 267-272, Reidel, 1978.
3. \*On the Hanf numbers of unbounded logics. In F.Jensen, B.Mayoh and K.Moller, editors, Proceedings from 5th Scandinavian Logic Symposium, pages 309-328, Aalborg University Press, 1979.
4. On the axiomatisability of the notion of an automorphism of a finite order, with Dionysis Anapolitanos. Zeitschrift für Mathematischen Logik und Grundlagen der Mathematik 26(5):433-437, 1980.
5. A quantifier for isomorphism, Zeitschrift für Mathematischen Logik und Grundlagen der Mathematik 26 (1980), pages 123-130.
6. Boolean valued models and generalized quantifiers, Annals of Mathematical Logic, 79(1980), pages 193-225.
7. The Hanf number of  $L_{\omega_1\omega_1}$ . Proceedings of American Mathematical Society 79:294-297, 1980.
8. Decidability of some logics with free quantifier variables, with Dionysis Anapolitanos. Zeitschrift für Mathematischen Logik und Grundlagen der Mathematik 27:17-22, 1981.
9. On orderings of the family of all logics, with Michal Krynicki. Archiv für Mathematischen Logik 22:141-158, 1982.
10. \*Craig's theorem and syntax of abstract logics. Bulletin of the section of logic 11(1/2):82-83, Polish Academy of Sciences, 1982.
11.  $\Delta$ -extensions and Hanf numbers. Fundamenta Mathematicae, 115:43-55, 1983.
12. Vector spaces and binary quantifiers, with Michal Krynicki and Alistair Lachlan. Notre Dame Journal of Formal Logic 25(1):72-78, 1984.
13. \*A hierarchy theorem for Lindström quantifiers, In M. Furberg et al, editors, Logic and abstraction, pages 317-323, Acta Philosophica Gotheburgensia 1, 1986.
14. Henkin and function quantifiers, with Michal Krynicki. Annals of Pure and Applied Logic 43:273-292, 1989.
15. On Scott and Karp trees of uncountable model, with Tapani Hyttinen. Journal of Symbolic Logic 55(3):897-908, 1990.
16. The Härtig-quantifier. A survey, with Heinrich Herre, Michal Krynicki and Anatoli Pinus. 33 pages, Journal of Symbolic Logic 56(4), 1991.
17. On the number of automorphisms of uncountable models, with Saharon Shelah and Heikki Tuuri, Journal of Symbolic Logic 58(1993), 1402-1418.
18. Stationary sets and infinitary logic, with Saharon Shelah, Journal of Symbolic Logic. 65:1311-1320, 2000.
19. Barwise: Abstract model theory and generalized quantifiers, Bulletin of Symbolic Logic, vol. 10:1, 2004, 37-53.
20. A note on extensions of infinitary logic, with Saharon Shelah, Archive for Mathematical Logic. 44:1, 63-69, 2005.

21. Abstract Model Theory as a Framework for Universal Logic, with Marta Garcia-Matos, *Logica Universalis* (J.-Y. Beziau, ed.), Birkhäuser, 2005, 19-33.
22. Recursive logic frames, with Saharon Shelah, *Archive for Mathematical Logic*. 52, No. 2 (2006).
23. On Applications of Transfer Principles in Model Theory, with J. Kennedy, In: *Set Theory: Recent Trends and Applications* (A. Andretta ed.), *Quaderni di Matematica*, vol 17, 2007, 111-136.
24. The Craig Interpolation Theorem in abstract model theory, *Synthese* (2008) 164:401-42.

### **Set theory, higher order logic**

25. \*Applications of set theory to generalized quantifiers. Ph.D. thesis, University of Manchester, 1977.
26. \*Remarks on generalized quantifiers and second-order logics. In *Set theory and hierarchy theory*, *Prace Naukowe Instytutu Matematyki Politechniki Wrocławskiej*, Wrocław, vol. 14 (1977), pages 117-123.
27. Two axioms of set theory with applications to logic. *Ann. Acad. Sci. Fenn. Ser. A I. Math. Diss.* 20:1-19, 1978.
28. \*Abstract logic and set theory, I: Definability. In M.Boffa, D.van Dalen and K.McAloon, editors, *Logic Colloquium '78*, pages 391-421, North-Holland, 1979.
29. Abstract logic and set theory, II: Large cardinals, *Journal of Symbolic Logic* 47 (1982), pages 335-345.
30. \*Generalized quantifiers in models of set theory. In G. Metakides, editor, *Patras Logic Symposium*, pages 359-371, North-Holland, 1982.
31. Set theoretic definability of logics. In J.Barwise and S.Feferman, editors, *Model Theoretic Logics*, pages 599-643, Springer, 1985.
32. Reflection principles for the continuum, with J. Stavi, *Logic and Algebra*, ed. Yi Zhang, pp. 59-84, *Contemporary Mathematics*, Vol 302, AMS, 2002.
33. On Ordinals accessible by Infinitary Languages, with Saharon Shelah and Pauli Väisänen, *Fundamenta Mathematicae* 186, 193-214, 2005.
34. Regular Ultrafilters and Finite Square Principles, with J. Kennedy and S. Shelah, *Journal of Symbolic Logic*, 73(2), 2008, 817-823.

### **Games**

35. Partially ordered connectives, with Gabriel Sandu. *Zeitschrift für Mathematische Logik und Grundlagen der Mathematik*, 38:361-372, 1992.
36. Game-theoretic inductive definability, with Juha Oikkonen, *Annals of Pure and Applied Logic* 65(1993), 265-306.
37. The Ehrenfeucht-Fraïssé game of length  $\omega_1$ , with Alan Mekler and Saharon Shelah, *Transactions of the American Mathematical Society* 339(1993), 567-580.
38. \*Games and trees in infinitary logic: A Survey. In M. Krynicki, M. Mostowski and L. Szczurba, editors, *Quantifiers*, Kluwer Academic Publishers, 1995, 105-138.
39. Reflection of long game formulas, with Heikki Heikkilä, *Mathematical Logic Quarterly* 40:381-392, 1994.
40. Trees and Ehrenfeucht-Fraïssé games, with Stevo Todorćević, *Annals of Pure and Applied Logic*, 100, 69-97, 1999.
41. On the semantics of informational independence, *Logic Journal of the Interest Group in Pure and Applied Logics* 10:3, 337-350, 2002.
42. More on the Ehrenfeucht-Fraïssé game of length  $\omega_1$ , with T. Hyttinen and S. Shelah, *Fund. Math.* 175 (2002), no. 1, 79-96.
43. Games played on partial isomorphisms, with B. Velickovic, *Archive for Mathematical Logic*, 43:1, 19-30, 2004.

44. Finite information logic, with R. Parikh, *Annals of Pure and Applied Logic*, 134, 83-93, 2005.
45. A remark on non-determinacy in IF logic, *Acta Philosophica Fennica*, 78 (2006) 71-77.
46. On Infinite Ehrenfeucht-Fraïssé Games, in: *Infinite Games, Foundations of the Formal Sciences V*, Stefan Bold, Benedikt Löwe, Thoralf Räscher, Johan van Benthem (eds.), College Publications at King's College (Studies in Logic), to appear.
47. Team logic, in: *Interactive Logic*, Johan van Benthem, Benedikt Löwe, Dov Gabbay (eds.), *Texts in Logic and Games*, vol 1. Amsterdam University Press, 2007, 281-302.
48. Modal dependence logic, in: *New Perspectives on Games and Interaction*, Krzysztof Apt, Robert van Rooij (eds.) *Texts in Logic and Games*, vol 5 Amsterdam University Press, 2008, 237-254.
49. Dependence of Variables Construed as an Atomic Formula, with W. Hodges. Accepted to *Annals of Pure and Applied Logic*.
50. On definability in dependence logic, with J. Kontinen. *Journal of Logic, Languages and Information* 18(3) (2009), 317 - 332.
51. From IF to BI, with S. Abramsky. *Synthese*. Volume 167, Number 2. March, 2009.
52. Dependence of Variables Construed as an Atomic Formula, with W. Hodges. Accepted to *Annals of Pure and Applied Logic*.

### **Finite model theory, computer science, semantics of natural language**

53. Generalized quantifiers and pebble games on finite structures, with Phokion Kolaitis in: *Proceedings of the 7th IEEE Symposium on Logic in Computer Science*, 1992.
54. Generalized quantifiers and pebble games on finite structures, with Phokion Kolaitis, *Annals of Pure and Applied Logic* 74(1995), 23-75,
55. Combinatorics and Quantifiers, with Jaroslav Nesetril, *Commentat. Math. Univ. Carol.* 37(3), 1996.
56. The Hierarchy Theorem for generalized quantifiers, with Lauri Hella and Kerkko Luosto, *Journal of Symbolic Logic* 61(1996), 802-817.
57. \*Finite Model Theory. In: C. Gefwert, P. Orponen and J. Seppänen, editors, *Logic, Mathematics and the Computer*, Publications of the Finnish Artificial Intelligence Society Number 14 (1996), 89-91.
58. Unary quantifiers on finite models, *Journal of Logic, Language and Information*. 6:275-304, 1997.
59. \*Generalized quantifiers. *Bulletin of the European Association for Theoretical Computer Science*. June 1997.
60. Definability of polyadic lifts of generalized quantifiers, with Lauri Hella and Dag Westerståhl, *Journal of Logic, Language and Information*. 6:305-335, 1997.
61. Quantifiers and congruence closure, with Jörg Flum and Mattias Schielen, *Studia Logica*, 62:3,315-340, 1999.
62. \*Semantics of mathematics on the web, with Mika Seppälä. *Semantic Web Kick-Off in Finland*, pages 265-273, Helsinki Institute for Information Technology Publications 2002-01.
63. On the expressive power of monotone natural language quantifiers over finite models, with Dag Westerståhl, *Journal of Philosophical Logic*, vol. 31 (2002), no. 4, 327-358.
64. Pseudo-finite model theory, *Matemática Contemporânea*, vol. 24, 2003, 169-183.
65. Lindström theorems for fragments of first order logic, with Balder ten Cate and Johan van Benthem, *Proceedings of LICS 2007*, pp 280-292. Journal version: *Logical Methods in Computer Science* 5(3) (2009) 1 - 27.

## Topology

66. Some remarks on pseudocompact spaces. *Ann. Acad. Sci. Fenn. Ser. A I Math* 559 (1973) 11 p.
67. A Cantor-Bendixson theorem for the space  $\omega_1\omega_1$ . *Fundamenta Mathematicae*, 37:187-199, 1991.
68. Trees and  $\Pi_1$ -subsets of  $\omega_1\omega_1$ , with Alan Mekler, *Journal of Symbolic Logic* 58(1993), 1052-1070.
69. A family of trees with no uncountable branches, with M. Dzamonja, *Topology Proceedings*, 28(1), 113-132, 2004.

## Philosophy

70. Second order logic and foundations of mathematics, *Bulletin of Symbolic Logic* 7 (2001), no. 4, 504-520.
71. Entry on Jaakko Hintikka in Borchert, Donald, ed. *Encyclopedia of Philosophy*, 2nd edition. Detroit: Macmillan Reference USA, 2006, 172-174.

## Popular articles

72. \*Uusi epätäydellisyys aritmetiikassa. *Archimedes* 31:30-37, 1979.
73. \*Äärettömyyden käsite Georg Cantorilla. In J. Oikkonen, editor, *Katsauksia Matematiikan Historiaan*, pages 88-101, Oy Gaudeamus Ab, Helsinki, 1982.
74. \*Herakles ja Hirviö, *Archimedes* 35:39-45, 1983.
75. \*Matemaattiset oliot. In L. Haaparanta, editor, *Olio*, Reports of the Department of Philosophy 3:142-146, University of Helsinki, 1984.
76. Wittgenstein och matematikens filosofi, *Nordisk Matematisk Tidskrift* 35(3):98-100, 1987.
77. \*Kummallisia olioita, with H. Salminen, *Tiede* 2000, 2/1993, s. 44-45.
78. \*Matkalla kohti ääretöntä, with H. Salminen, *Tiede* 2000, 3/1993, s. 58-59.
79. \*Umpikuja - tie uuteen, with H. Salminen, *Tiede* 2000, 4/1993, s. 48-49.
80. \*Kuka ratkaisee matematiikan mysteerin, with H. Salminen, *Tiede* 2000, 5/1993, s. 60-61.
81. \*Kunnon ongelmassa herkkua monelle, with H. Salminen, *Tiede* 2000, 6/1993, s. 48-49.
82. \*Kuka laskisi kolmion kulmien summan, with H. Salminen, *Tiede* 2000, 8/1993, s. 56-57.
83. \*Fermat'n suuri lause todistettu, with H. Salminen, *Helsingin Sanomat*, 3.7.1993.
84. \*Logiikka on ajattelun matematiikkaa, with H. Salminen, *Tiede* 2000, 1/1994, s. 56-59.
85. \*Laattoja pitkin äärettömään, with H. Salminen, *Tiede* 2000, 8/1994, s. 54-57.
86. \*Tietotokone kompastuu matematiikan rajoihin, with H. Salminen, *Tiede* 2000, 2/1995, s. 38-40.
87. \*Kultainen leikkaus - harmonian avain, with H. Salminen, *Tiede* 2000, 4/1995, s. 66-68.
88. \*Matematiikka, kiehtova tiede, with H. Salminen, *Mitä Missä Milloin* 95, 1994, s. 363-367.
89. \*Logiikka - kielen matematiikka, with H. Salminen, *Mitä Missä Milloin* 96, 1995.
90. \*Roomalaisten numeroiden nousu ja tuho, *Mitä Missä Milloin* 2000, 1999, 330-334.
91. \*Onko matemaattinen totuus suhteellista vai absoluuttista. In J. Rydman, editor, *Suhteellista? Pages 266-283*, Yliopistopaino, Helsinki, 2005.
92. \*How complicated can structures be? *Nieuw Archief voor Wiskunde*. June 2008, 117-121.
93. \*Mathematics for Everyday Life, Special issue of *ERCIM News*, with Introduction, edited with Ulrich Trottenberg. 73 (2008 *ERCIM News*)

## Books

94. Matemaattinen logiikka, Oy Gaudeamus Ab, Helsinki, 1987, second edition 1988, 144p.
95. Johdatus logiikkaan, with H. Salminen, Oy Gaudeamus Ab, Helsinki 1992, 159 pages.
96. Logic Colloquium '90 (editor, with J. Oikkonen), Lecture Notes in Logic , vol. 2, Springer-Verlag, 1993.
97. Matematiikan Taito 12: Numeeriset Menetelmät, with H. Salminen, Weilin+Göös, 1996, 94 pages, second edition 1997.
98. Generalized Quantifiers and Computation, Jouko Väänänen, editor, Lecture Notes in Computer Science, vol. 1754, Springer, 1999.
99. Logic Colloquium '03 (editor, with V. Stoltenberg-Hansen), Lecture Notes in Logic, vol. 24, Association for Symbolic Logic, 2006.
100. Dependence Logic, Cambridge University Press, London Mathematical Society Student Texts 70, 225 pages, 2007.
101. Logic Colloquium 2006 (editor, with S. Barry Cooper, Herman Geuvers, and Anand Pillay). Proceedings of the Annual European Summer Meeting of the Association for Symbolic Logic. Lecture Notes in Logic. Cambridge University Press, 2009.

## Edited journal issues

102. Annals of Pure and Applied Logic Volume 156, Issue 1, (2008). Logic Colloquium 2006. Edited by S.B. Cooper, H. Geuvers, A. Pillay and J. Väänänen.

## Abstracts

103. \*Higher order logic and set theory. Notices Amer. Math. Soc. 25.1(1978), A-15.