Curriculum Vitae

(including list of publications)

Thomas Strahm

Current affiliation

Logic and Theory Group
Institute of Computer Science and Applied Mathematics
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Personal data

Date and place of birth: April 12, 1965 in Berne, Switzerland

Citizenship: Swiss

Research keywords

Mathematical logic and theoretical computer science, more specifically proof theory, explicit mathematics, predicativity and metapredicativity, higher type functionals, as well as applicative theories and computational complexity.

Education

1972–1985 Elementary school, secondary school and grammar school in Berne. Matura examination.

1985–1992 Studies of computer science, mathematics and philosophy at the University of Berne. Master's degree in computer science [mathematics, philosophy] (Lic. phil. nat; Diplom-Informatiker). Advisor: Prof. Dr. G. Jäger.

June 1996 PhD in computer science (Dr. phil. nat; "excellent"). Thesis: "On the Proof Theory of Applicative Theories". Advisor: Prof. Dr. G. Jäger.

June 2001 Venia docendi for theoretical computer science and logic at the University of Berne. Habilitation thesis: "Proof-theoretic contributions to explicit mathematics".

Academic employment history

1989–1992 Student teaching assistant (Hilfsassistent) at the Institute for Computer Science and Applied Mathematics of the University of Berne with Prof. G. Jäger.

Nov. 1992 – Dec. 1995 Researcher in the Swiss national science foundation project "Algebraische und logische Aspekte der Wissensverarbeitung" with Prof. G. Jäger at the Institute for Computer Science and Applied Mathematics of the University of Berne.

1992 – 2003 Assistant in theoretical computer science and logic with Prof. G. Jäger at the Institute for Computer Science and Applied Mathematics of the University of Berne.

Sept. 2003 – Docent (with tenure) at the Institute for Computer Science and Applied Mathematics of the University of Berne.

Aug. 2007 – Feb. 2008 Titularprofessor at the Institute for Computer Science and Applied Mathematics of the University of Berne.

Mar. 2008 – Assoziierter Professor at the Institute for Computer Science and Applied Mathematics of the University of Berne.

Research stays

July 1992 Mathematical Institute of the Czech Academy of Sciences in Prague (Prof. J. Krajíček, Prof. P. Pudlák).

Oct. 1995 – Dec. 1995 Stanford University, Department of Mathematics (Prof. S. Feferman).

Feb. 1998 – Apr. 1998 Stanford University, Department of Mathematics (Prof. S. Feferman).

Feb. 2001 – Apr. 2001 Mittag-Leffler Institute of the Royal Swedish Academy of Sciences in Stockholm (Logic year 2000/2001).

Mar. 2010 – June 2010 University of Swansea, Department of Computer Science.

Honours

1992 Fachpreis of the Fachbereich Mathematik.

1994 – 1996 Fellow of Schweizerische Studienstiftung.

1995 Faculty award of the Philosophisch-naturwissenschaftliche Fakultät of the University of Berne.

1998 Theodor Kocher award of the University of Berne.

2001 Haller medal of the University of Berne.

2019 Dsitinguished evaluation result of the course *Computability and Complexity* (in the spring semester 2019, 144 courses of the faculty of science with the best 4 (2.7 %) were evaluated with excellent score.

Professional activities

Member of the Association for Symbolic Logic

Member of the Deutsche Vereinigung für Mathematische Logik und Grundlagen der exakten Wissenschaften DVMLG

Member of the Swiss Society of Logic and Philosophy of Sciences SSLPS (Secretary 2000-2009; President 2010 – 2013)

Member of the Swiss Computer Science Society (former program committee member)

Member of the consulting board of *Dialectica*

Member of the editorial board of *The Journal of Symbolic Logic*

Refereeing for journals and proceedings

Reviewer for Mathematical Reviews and Zentralblatt MATH

Expert for "Maturitätsprüfungen Mathematik and Informatik"

Co-organizer of International Workshop on Applicative Theories (Berne, 1994)

Co-organizer of International Workshop on Applicative Theories and Explicit Mathematics WATEM '96 (Berne, 1996)

Program committee member of International Conference on Logic and Complexity (Münchenwiler, February 2000)

Co-organizer of the 2001 annual meeting of the SSLPS "Logic and Complexity" (Berne, October 2001)

Co-organizer of the 2003 annual meeting of the SSLPS "Logic and the Net" (München-wiler, October 2003)

Co-organizer of the 2004 annual meeting of the SSLPS "Modern uses of lambda calculi" (Berne, October 2004)

Co-organizer of the Special Session on Proofs and Computation, Computability in Europe CiE '06 (Swansea, Wales, June 2006)

Program- and organizing committee member of Computer Science Logic CSL '07 (Lausanne, September 2007)

Organizing committee member of Logic Colloquium LC '08 (Bern, July, 2008)

Program- and organizing committee member of Workshop on Recent Trends in Proof Theory (Bern, July 2008)

Program committee member of "Explicit paradigms in logic and computer science" (Bern, June 2012)

Program- and organizing committee member of "Turing under discussion" (Zürich, October 2012)

Program- and organizing committee member of "Advances in proof theory" (Bern, December 2014)

Co-applicant of SNF Project "Logische und algebraische Aspekte der Wissensverarbeitung" (Nov. 1998 - Sep. 2017; Grant numbers NF 2000-052424, NF 20-061669, NF 200020-100011, NF 200020-107443, NF 200020-119759; NF 200020-137678; NF 200020-156061)

Collaborator in the cooperation project "Logic and information" within the "Réseau BeNeFri" (2005 - 2007; supported by Swiss University Conference CUS)

Co-applicant of Switzerland-Russia S&T Cooperation Programme Project "Computational proof theory" (2010 - 2012)

Publications

1. *Aspekte des nicht-monotonen Schliessens*, Minor thesis, Institute of Philosophy, University of Berne, 1990, 121 pp.

2. *Theories with self-application of strength PRA*, Master's thesis, Institute for Computer Science and Applied Mathematics, University of Berne, June 1992, 86 pp.

3. *Totality in applicative theories*, with G. Jäger, Annals of Pure and Applied Logic 74(2), 1995, pp. 105–120.

4. *Second order theories with ordinals and elementary comprehension*, with G. Jäger, Archive for Mathematical Logic 34(6), 1995, pp. 345–375.

5. *Partial applicative theories and explicit substitutions*, Journal of Logic and Computation 6(1), 1996, pp. 55–77.

6. *Some theories with positive induction of ordinal strength $\varphi\omega 0$*, with G. Jäger, Journal of Symbolic Logic 61(3), 1996, pp. 818–842.

7. *Systems of explicit mathematics with non-constructive μ operator and join*, with Th. Glaß, Annals of Pure and Applied Logic 82(2), 1996, pp. 193–219.

8. *On the proof theory of applicative theories*, PhD thesis, Institute for Computer Science and Applied Mathematics, University of Berne, June 1996, 99 pp.

9. *Polynomial time operations in explicit mathematics*, Journal of Symbolic Logic 62(2), 1997, pp. 575–594.

10. *The μ quantification operator in explicit mathematics with universes and iterated fixed point theories with ordinals*, with M. Marzetta, Archive for Mathematical Logic 37(5+6), 1998, pp. 391–413.

11. *Logik in Informatik, Mathematik und Philosophie*, Theodor Kocher award lecture, University of Berne, January 1999, 16 pp.

12. *Bar induction and ω model reflection*, with G. Jäger, Annals of Pure and Applied Logic 97(1–3), 1999, pp. 221–230.

13. *The proof-theoretic analysis of transfinitely iterated fixed point theories*, with G. Jäger, R. Kahle and A. Setzer, Journal of Symbolic Logic 64(1), 1999, pp. 53–67.

14. *On applicative theories*, with G. Jäger and R. Kahle, in Logic and Foundations of Mathematics, A. Cantini, E. Casari, P.L. Minari (Eds.), Kluwer, 1999, pp. 83–92.

15. *First steps into metapredicativity in explicit mathematics*, in Sets and Proofs, B. Cooper and J. Truss (Eds.), Cambridge University Press, 1999, pp. 383–402.

16. *Autonomous fixed point progressions and fixed point transfinite recursion*, in Logic Colloquium '98, S. Buss, P. Hájek, P. Pudlák (Eds.), ASL Lecture Notes in Logic 13, A K Peters, 2000, pp. 449–464.

17. *The non-constructive μ operator, fixed point theories with ordinals, and the bar rule*, Annals of Pure and Applied Logic 104(1–3), 2000, pp. 305–324.

18. *The unfolding of non-finitist arithmetic*, with S. Feferman, Annals of Pure and Applied Logic 104(1–3), 2000, pp. 75–96.

19. *Fixed point theories and dependent choice*, with G. Jäger, Archive for Mathematical Logic 39(7), 2000, pp. 493–508.

20. *Proof-theoretic contributions to explicit mathematics*, Habilitation thesis, Institute for Computer Science and Applied Mathematics, University of Berne, 2001, 163 pp.

21. *Upper bounds for metapredicative Mahlo in explicit mathematics and admissible set theory*, with G. Jäger, Journal of Symbolic Logic 66(2), 2001, pp. 935–958.

22. *The proof-theoretic strength of the Suslin operator in applicative theories*, with G. Jäger, in Reflections on the Foundations of Mathematics: Essays in honor of Solomon Feferman, W. Sieg, R. Sommer, C. Talcott (Eds.), ASL Lecture Notes in Logic 15, A K Peters, 2002, pp. 270–292.

23. *Intuitionistic fixed point theories for strictly positive operators*, with Ch. Rüede, Mathematical Logic Quarterly 48(2), 2002, pp. 195–202.

24. *Wellordering proofs for metapredicative Mahlo*, Journal of Symbolic Logic 67(1), 2002, pp. 260–278.

25. *Theories with self-application and computational complexity*, Information and Computation 185, 2003, pp. 263–297.

26. *A proof-theoretic characterization of the basic feasible functionals*, Theoretical Computer Science 329, 2004, pp. 159–176.

27. *Reflections on reflections in explicit mathematics*, with G. Jäger, Annals of Pure and Applied Logic 136(1–2), 2005, pp. 116-133.

28. *On the proof theory of type two functionals based on primitive recursive operations*, with D. Steiner, Mathematical Logic Quarterly 52(3), 2006, pp. 237-252.

29. *Primitive recursive selection functions for existential assertions over abstract algebras*, with J. Zucker, Journal of Logic and Algebraic Programming 76(2), 2008, pp. 175-197.

30. *Gödel's Dialectica interpretation*, Guest Editor, Special Issue, Dialectica 62(2), 2008, pp. 145-290.

31. *Elementary explicit types and polynomial time operations*, with D. Spescha, Mathematical Logic Quarterly 55(3), 2009, pp. 245–258.

32. *Weak theories of operations and types*, in Ways of Proof Theory, R. Schindler (Ed.), Ontos Verlag, 2010, pp. 441–468.

33. *The unfolding of finitist arithmetic*, with S. Feferman, Review of Symbolic Logic 3(4), 2010, pp. 665–689.

34. *Realisability in weak systems of explicit mathematics*, with D. Spescha, Mathematical Logic Quarterly 57(6), 2011, pp. 551–565.

35. *Admissible closures of polynomial time computable arithmetic*, with D. Probst, Archive for Mathematical Logic 50(5–6), 2011, pp. 643-660.

36. *Weak theories of truth and explicit mathematics*, with S. Eberhard, in Logic, Construction, Computation, U. Berger, H. Diener, P. Schuster, M. Seisenberger (Eds.), Ontos Verlag, 2012, pp. 157–184.

37. *A note on the theory* $\mathsf{SID}_{<\omega}$ *of stratified induction*, with F. Ranzi, Mathematical Logic Quarterly 60(6), 2014, pp. 487–497.

38. *Unfolding feasible arithmetic and weak truth*, with S. Eberhard, in Unifying the Philosophy of Truth, D. Achourioti, H. Galinon, K. Fujimoto, J. Martinez (Eds.), Springer, 2015, pp. 153–167.

39. *Turing's Revolution: The Impact of His Ideas About Computability*, edited with G. Sommaruga, Birkhäuser, 2015, 329 pp.

40. *Advances in Proof Theory*, edited with R. Kahle and T. Studer, volume 28 of Progress in Computer Science and Applied Logic, Birkhäuser, 2016, 425 pp.

41. *Theories of proof-theoretic strength* $\Psi\Gamma_{\Omega+1}$, with U. Buchholtz and G. Jäger, in Concepts of Proof in Mathematics, Philosophy, and Computer Science, D. Probst, P. Schuster (Eds.), De Gruyter, 2016, pp. 115–140.

42. *Unfolding schematic systems*, in Feferman on Foundations – Logic, Mathematics, Philosophy, G. Jäger and W. Sieg (Eds.), Springer, 2017, pp. 187–208.

43. *A flexible type system for the small Veblen ordinal*, with F. Ranzi, Archive for Mathematical Logic 58(5–6), 2019, pp. 711–751.

Abstracts

44. *Systems of explicit mathematics with primitive recursive operations plus non-constructive μ operator*, 10th International Congress of Logic, Methodology and Philosophy of Science, Florence, 1995, p. 63.

45. *Polynomial time operations in applicative theories*, Bulletin of Symbolic Logic 3(1), 1997, pp. 105–106.

46. *The μ quantification operator in explicit mathematics with universes*, with M. Marzetta, Bulletin of Symbolic Logic 3(1), 1997, pp. 127–128.

47. *Aspects of metapredicativity*, Bulletin of Symbolic Logic 4(1), 1998, pp. 72–73.

48. *Metapredicativity*, Bulletin of Symbolic Logic 5(1), 1999, pp. 67–68.

49. *Bounded applicative theories*, Bulletin of Symbolic Logic 7(1), 2001, p. 150.

50. *Unfolding finitist arithmetic*, with S. Feferman, Bulletin of Symbolic Logic 7(1), 2001, pp. 111-112.

51. *On the proof theory of type two functionals*, Oberwolfach Reports 2(1), 2005, pp. 804-805.

52. *Weak theories of operations and types*, Bulletin of Symbolic Logic 15(1), 2009, pp. 100–101.

53. *Weak theories of operations, truth, and types*, Oberwolfach Reports , 8(4), 2011, pp. 2997–2998.

54. *Towards the unfolding of feasible arithmetic*, with S. Eberhard, Bulletin of Symbolic Logic 18(3), 2012, pp. 474–475.

55. *Unfolding schematic formal systems: From non-finitist to feasible arithmetic*, Bulletin of Symbolic Logic, Bulletin of Symbolic Logic 20(3), 2014, pp. 381-382.

56. *A flexible type system for the small Veblen ordinal*, with F. Ranzi, Oberwolfach Reports, 11(4), 2014, p. 2943.

Reviews

57. Review of *Andrea Cantini, Logical frameworks for truth and abstraction, Elsevier, 1996*, Journal of Symbolic Logic 63(1), 1998, pp. 328–329.

58. Review of *Andreas Weiermann, How is it that infinitary methods can be applied to finitary mathematics? Gödel's T: a case study, Journal of Symbolic Logic 63, 1998*, Bulletin of Symbolic Logic 8(3), 2002, pp. 435-436.

59. Review of *Sergei Tupailo, Realization of analysis into explicit mathematics, Journal of Symbolic Logic 66, 2001*, Bulletin of Symbolic Logic 9(1), 2003, pp. 42-43.

60. Review of *Katalin Bimbó, Proof Theory: Sequent calculi and related formalisms, CRC Press, 2014*, Bulletin of Symbolic Logic 22(2), 2016, pp. 288-289.

61. Numerous reviews for Mathematical Reviews.

62. Numerous reviews for Zentralblatt Math.

Preprints of most publications are available online at `http://www.iam.unibe.ch/~strahm`

Selected talks

* Invited conference or workshop talk

Applicative theories and term models, Workshop on Applicative Theories, Berne, March 1994.

Partiality versus totality in applicative theories, International conference on Proof Theory, Provability Logic, and Computation PPC '94, Berne, March 1994.

Beweise als Progamme, Colloquium Philosophical Society Berne, June 1994.

Induction in applicative theories*, EC Workshop on Proof Theory and Computation, Leeds, September 1994.

Polynomial time operations in applicative theories*, Conference on Mathematical Logic, Oberwolfach, April 1995.

Polynomial time operations in explicit mathematics*, Special Session on Proof Theory, Logic Colloquium '95, Haifa, August 1995.

Systems of explicit mathematics with primitive recursive operations plus non-constructive μ operator, 10th International Congress of Logic, Methodology and Philosophy of Science, Florence, August 1995.

Some new proof-theoretic results about explicit mathematics with non-constructive μ operator, Stanford Logic Seminar, October 1995.

Polynomial time operations in applicative theories, Logic Colloquium, SRI International, Menlo Park, December 1995.

Zur Beweistheorie von applikativen Theorien, PhD defense, Berne, June 1996.

The non-constructive μ operator in explicit mathematics: a survey, Workshop on Applicative Theories and Explicit Mathematics, Berne, June 1996.

Abstrakte Berechnungen in expliziter Mathematik, Workshop Theoretische Informatik und Logik, Schloss Münchenwiler, April 1997.

The unfolding of non-finitist arithmetic, Workshop on Proof Theory and Ordinal Analyses, Münster, May 1997.

Aspects of metapredicativity*, Special Session on Proof Theory, Logic Colloquium '97, Leeds, July 1997.

Metapredicativity*, Conference on Mathematical Logic, Oberwolfach, January 1998.

Recent results in metapredicative proof theory, Stanford Logic Seminar, March-April 1998.

Abstract computations in type-free applicative systems*, Workshop on Proof Theory and Complexity, Aarhus, August 1998.

Metapredicativity*, Plenary lecture, Logic Colloquium '98, Prague, August 1998.

Universes in explicit mathematics and admissible set theory*, Workshop on Operations, Sets, and Types, Castiglioncello, October 1998.

Reflective closures of formal systems*, Reflections Symposium, Stanford, December 1998.

Logik in Informatik, Mathematik und Philosophie, Theodor Kocher award lecture, University of Berne, January 1999.

Bar induction and ω model reflection*, Research Workshop on Proof Theory, Leeds, February 1999.

Theories with self-application and computational complexity*, Workshop on Proof and Computation, Munich, November 1999.

The implicitness program, Philosophical Colloquium, University of Bonn, November 1999.

Applikative Theorien und Komplexität, Computer Science Colloquium, University of Tübingen, January 2000.

Applicative theories and classes of computational complexity, Logic Seminar, University of Florence, May 2000.

Bounded applicative theories, Logic Colloquium 2000, Paris, July 2000.

Unfolding finitist arithmetic, Logic Colloquium 2000, Paris, July 2000.

Untyped applicative theories and computational complexity, Mittag-Leffler seminar, Institute Mittag-Leffler, Stockholm, March 2001.

Das P-NP-Problem und die Grenzen der praktischen Berechenbarkeit, Habilitations-Kolloquium, Berne, June 2001.

Type-free applicative systems: a proof-theoretic approach to complexities*, Dagstuhl seminar on Proof Theory in Computer Science, Dagstuhl, October 2001. (not delivered because of illness).

A proof-theoretic characterization of the basic feasible functionals*, Conference on Mathematical Logic, Oberwolfach, April 2002.

On bounded applicative theories and computational complexities*, Bounded Arithmetic and Complexity Classes BACC 2002, Lisbon, June 2002.

Logik in Informatik und Mathematik, Forum Mathematik und Unterricht, Berne, May 2004.

Logik im interdisziplinären Spannungsfeld zwischen Informatik, Mathematik und Philosophie, Fachschaftstagung Mathematik, Gymnasium Köniz, November 2004.

On the proof theory of type two functionals*, Conference on Mathematical Logic, Oberwolfach, April 2005.

Unfolding schematic formal systems, Swiss-South African Joint Seminar, Berne, January 2007.

Kripke-Platek set theory over polynomial time computable arithmetic, Proof, Computation, Complexity '07, Swansea, Wales, April 2007.

Einige Ideen und Probleme der theoretischen Informatik, Kolloquium Informatik und Unterricht, Berne, January 2008.

Weak theories of operations and types*, Plenary Lecture, Logic Colloquium '08, Berne, July 2008.

Primitive recursive selection functions for existential assertions over abstract algebras*, Proof Theory: Workshop on Logic, Foundational Research, and Metamathematics, Münster, July 2008.

Unfolding arithmetic, Logic Seminar, University of Florence, December 2008.

Unfolding arithmetic - with an emphasis on finitism*, Leeds Symposium on Proof Theory and Constructivism, Leeds, July 2009.

Two unfoldings of finitist arithmetic, Proof, Complexity and Verification Seminar, University of Swansea, Wales, April 2010.

The unfolding of non-finitist and finitist arithmetic, Philosophy of Mathematics Seminar, University of Oxford, May 2010.

Das P-NP-Problem und die Grenzen der praktischen Berechenbarkeit, Fachschaftstagung Informatik, Mathematik und Physik, Gymnasium Muristalden, Berne, November 2010.

Weak theories of truth and explicit mathematics*, Axiomatic Theories of Truth, Oxford, September 2011.

Weak theories of operations, truth and types*, Conference on Mathematical Logic, Oberwolfach, November 2011.

Types and truth in weak applicative theories*, Logical Models of Reasoning and Computation, Moscow, February 2012.

Weak theories of explicit mathematics and positive truth, Stanford Logic Seminar, July 2012.

Unfolding schematic formal systems: From non-finitist to feasible arithmetic*, Special Session on Proof Theory, Logic Colloquium '12, Manchester, July 2012.

Unfolding schematic systems: a survey*, Humboldt Kolleg Proof, Bern, September 2013.

Finitely stratified inductive definitions, Stanford Logic Seminar, Stanford, October, 2013.

A flexible type system for the small Veblen ordinal*, Conference on Mathematical Logic, Oberwolfach, November 2014.

A Feferman-style type system for the small Veblen ordinal*, Trends in Proof Theory, Hamburg, September 2015.

Unfolding schematic systems — with an emphasis on inductive definitions*, Utrecht Workshop on Proof Theory, Utrecht, April 2015.

Weak theories of operations, types, and truth, OST-meeting in honour of Andrea Cantini, Florence, December 2016.

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