

# LAWRENCE S. MOSS

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## Personal Data

Born August 14, 1959. U.S. citizen. Married, two children.

## Education

1984: Ph.D., Mathematics, UCLA  
Ph.D. Dissertation: Power Set Recursion  
Thesis Advisor: Yiannis N. Moschovakis  
1981: M.A., Mathematics, UCLA  
1979: B.A., Mathematics, UCLA

## Academic Employment

2003–present: Professor of Mathematics, Indiana University, Bloomington.  
Also: Director, Program in Pure and Applied Logic (since 2001).  
Director of Graduate Studies, Cognitive Science Program (2015–19).  
Adjunct Professor of Computer Science,  
Informatics, Linguistics, and Philosophy.  
Core member, Cognitive Science Program.  
Member, Computational Linguistics Program.  
1990–2003: Assistant/Associate Professor, Indiana University, Bloomington.  
Tenure: 1994.  
1988–90: Postdoctoral Fellow, Mathematical Sciences Department,  
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.  
1985–88: Assistant Professor of Mathematics, University of Michigan, Ann Arbor.  
1984–85: Postdoctoral Fellow, Center for the Study of Language and Information,  
Stanford University.

## Research Interests

Applied Logic: the study of mathematical and conceptual tools for use in fields such as computer science, philosophical logic, cognitive science, artificial intelligence, and linguistics. My specific interests in the past few years include coalgebra and coalgebraic logic, non-wellfounded sets, dynamic epistemic logic, the logic of recursion, and logic for natural language inference. Applied logic is applied mathematics. It is logic looking outward rather than inward.

## Honors and Awards

Trustees' Teaching Award, in recognition of excellence in the teaching of mathematics, IU 2019.

Honorable Mention, NSF "We Are Mathematics" video competition, 2019.

<https://wearemathematics2019.skild.com/skild2/wearemathematics2019/viewEntryVoting.action#votenow>

Simons Foundation Collaboration Grant #586136, 2018–23.

Distinguished Visitor, Haverford College, March 2016.

CSLI Fellowship, November 2015.

Trustees' Teaching Award, in recognition of excellence in the teaching of mathematics, IU 2013.

Simons Foundation Collaboration Grant #245591, 2012–17.

NSF BCS-1019206 in support of NASSLLI instructors and students, 2010-12.

Trustees' Teaching Award, in recognition of excellence in the teaching of mathematics, IU 2006.

Rothrock Teaching Award, IU Mathematics Department, 2002.

Fellow, Freshman Learning Project, Indiana University, 1999.

Teaching Excellence Recognition Award, Indiana University, 1998.

Summer Faculty Fellowship, Indiana University, 1991.

Daus Prize for the outstanding graduate in mathematics, UCLA, 1979.

Member, Phi Beta Kappa Fraternity.

Departmental Scholar in Mathematics, UCLA, 1978–79.

Summa Cum Laude graduate, UCLA, 1979.

Regents' Graduate Intern Fellowship, UCLA, 1979–83.

## Ph.D. Students at Indiana University

1. Andrew Dabrowski, Mathematics, 1995. Thesis title: Set Theoretic Representations of Form Systems and Elementary Universes. Lecturer in Mathematics, IU Bloomington.
2. Hans-Jörg Tiede, Linguistics and Cognitive Science, 1999. Thesis title: Deductive Systems and Grammars. Address: Director of Research, American Association of University Professors.
3. Maricarmen Martinez, Mathematics and Cognitive Science, 2004. Thesis title: Logic and Inference in State Spaces. Address: Departamento de Matemáticas, Universidad de los Andes, Bogotá, Colombia.
4. Lei Qian, Mathematics and Computer Science, 2004. Thesis title: Message Dependence and Formal Verification of Authentication Protocols. Address: Computer Science Department, Fisk University, Tennessee.
5. Jay Mersch, Mathematics, 2004. Thesis title: Equational Logic of Recursive Program Schemes. Address: Xavier University, New Orleans, Louisiana.

6. Yuko Murakami, Philosophy, 2005. The co-chair of her committee was J. Michael Dunn. Thesis title: Modal Logic of Partitions. Professor, Graduate School of Artificial Intelligence, Rikkyo University, Japan.
7. Ignacio Viglizzo, Mathematics, 2005. Thesis title: Coalgebras on Measurable Spaces. Address: Universidad Nacional del Sur, Bahía Blanca, Argentina.
8. Seunghwan Lee, Mathematics and Cognitive Science, 2006. Thesis title: Probabilistic Reasoning on Metric Spaces. Address: Fidelity Hedge Fund.
9. Joshua Sack, Mathematics, 2007. Thesis title: Adding Temporal Logic to Dynamic Epistemic Logic. Address: Department of Mathematics, California State University, Long Beach.
10. Chunlai Zhou, Mathematics, 2007. The co-chair of his committee was J. Michael Dunn. Thesis title: Probability Logics of Type Spaces. Address: Computer Science Department, Renmin (People's) University of China, Beijing.
11. Saleh Aliyari, Mathematics, 2010. Thesis title: Topological Presentation of Canonicity Conjectures for Varieties of Modal Algebras. Address: Visiting Assistant Professor, Mathematics, Adelphi University.
12. Jiho Kim, Mathematics, 2010. Thesis title: Higher-order Algebras and Coalgebras. Most recent information: Sr. Software Engineer IXL Learning, San Mateo CA.
13. Kyle Riggs, Mathematics, 2014. Thesis title: The Computable Properties of Decomposable and Completely Decomposable Groups. I was his *de jure* advisor; his *de facto* advisor was Steffen Lemp of the University of Wisconsin, Madison. Address: Math Department, Eastern Washington University.
14. William Tune, Mathematics, 2016. Thesis Title: A Lambda Calculus for Monotonicity Reasoning. Address: Math Department, Cumberland University.
15. David Sprunger, Mathematics, 2017. Thesis topic: Logics for Coalgebras of Finitary Set Functors. Address: University of Birmingham, UK.
16. Robert Rose, Mathematics, 2020. Thesis title: The Natural Numbers in Predicative Univalent Type Theory. Current address: Department of Mathematics and Computer Science, Wesleyan University.
17. Hai Hu, Linguistics, 2021. The co-chair of his committee was Sandra Kübler. Thesis title: Symbolic and Neural Approaches to Natural Language Inference. Current address: Department of English, Shanghai Jiao Tong University.
18. Noah Kaufmann, Mathematics, expected 2022.

I also have served on several committees for independent BA majors and for BA honors theses.

## External Ph.D. Committees

I have been an external member of the Ph.D. committees of Lasha Abzianidze (Linguistics, Tilburg University), Sabine Frittella, (Mathematics and Computer Science, Université d'Aix Marseille), Sofia Knight (Computer Science, LIX, École Polytechnique de Paris); Rachel Lunnon (Mathematics, U. Manchester, UK); Jelle Gerbrandy (Philosophy, U. Amsterdam); Hans van Dittmarsch (Computer Science, U. Groningen, Netherlands), Konstantinos Georgatos, Gilbert Njatou, Angela Weiss, and Ruili Ye (Mathematics or Computer Science, CUNY Graduate Center); Jesse Hughes (Philosophy, Carnegie Mellon University), Falk Bartels (Computer Science, Free University of Amsterdam), Stefan Milius (Institute of Theoretical Computer Science, Technical University, Braunschweig, Germany), Clemens Kupke (University of Amsterdam ILLC and CWI), Simon Kramer (ETH, Lausanne Switzerland), and Ichiro Hasuo (U. Nijmegen). I also have been on two committees to determine whether certain PhD dissertations in the Netherlands should be awarded *cum laude*.

## Postdoctoral and Graduate Student Mentoring

Joseph Miller, IU Math Department VIGRE Postdocal Fellow, 2002-03, 2004-05.

Jörg Endrullis, Vrije Universiteit Amsterdam, Assistant Professor, 2014-15.

Siddharth Bhaskar, IU Math Department Assistant Professor, 2015-17.

Lawrence Valby, IU Math Department Assistant Professor, 2015-17.

Alex Kruckman, IU Math Department Assistant Professor, 2016-19.

Victoria Noquez, IU Math Department Assistant Professor, 2019-22.

Fu Qingfang, graduate student in the Peking University Philosophy Department. She was supported by the China Research Council on a two-year visit to IU.

Erik Estre, graduate student in Mathematics from the University of Canterbury, New Zealand.

## Undergraduate Mentoring

Sam Ziegler (Mathematics REU student), Carnegie Mellon University, 2008. The title of his paper was *Tractatus Logico-Syllogisticus*.

Elizabeth Kammer (Mathematics REU student), University of Alabama, 2010. The title of her paper was *Systems of Natural Logic with Adjectives and Their Completeness*.

Charlotte Raty (Mathematics REU student), Swarthmore College, 2017. Her title was *Logic with “Most” and Cardinality Comparisons*.

Sarah Bauer, IU Cox Research Scholars Program, 2011-12.

Kirubel Benaflew, Jackson State University, Mississippi. He came as part of the IU MSI-Initiative, summer 2016.

Colleen Lee, IU Center for Women & Technology Emerging Scholars Research Experiences for Undergraduate Women, 2019–20.

Annie Pompa, IU Center for Women & Technology Emerging Scholars Research Experiences for Undergraduate Women, 2020–21.

Matthew Hayden, IU STARS Program, 2020–present.

## **Director, IU Program in Pure and Applied Logic, 2001-06, 2007–present**

I am responsible for advising students, organizing our weekly seminar, and leading faculty decisions on our graduate courses. The program also issues a Logic Certificate to students completing a series of courses. My goal is to build the program into a leading center for work on applied logic.

## **Courses Taught at Graduate/Postgraduate Summer Schools**

EASLLC = East Asian Summer School on Language, Logic, and Computation

ESSLLI = European Summer School on Language, Logic, and Information

NASSLLI = North American Summer School on Language, Logic, and Information

*Logic for Language, Logic in Language*, at NASSLLI'18, Pittsburgh, June 2018.

*Natural Logic*, at the Third Nordic Logic Summer School (NLS), Stockholm, August 2017.

*Natural Logic*, at EASLLC'14, Beijing, July 2014.

*Natural Logic*, at NASSLLI'14, College Park, Maryland, June 2014.

*Recursion and Circularity*, at the TACL 2013 (Topology, Algebra, and Categories in Logic 2013) Summer School, Nashville, TN, July 2013.

*Circularity*, at ESSLLI'12, Opole, Poland, August 2012.

*Logics for Natural Language Inference*, at ESSLLI'10, Copenhagen, Aug. 2010.

*Coalgebra and Circularity*, invited course for the MATHLOGAPS Summer School, Manchester UK, July 2008.

*Natural Logic*, at ESSLLI'07, Dublin, August 2007.

*Language, Logic, and Information*, at the NASSLLI'04, UCLA, June 2004.

*Dynamic Epistemic Logic*, at NASSLLI'02, Stanford, June 2002.

*Circularity*, at ESSLLI'97, Aix-en-Provence, August 1997.

*Situation Theory*, at the First Conference on Information-Oriented Approaches to Logic, Language and Computation, Moraga, California, June 1994.

*Non-wellfounded Sets and Applications*, at the Danish Research Academy Summer School on Logical Methods in Concurrency, Aarhus, August 1993.

*Foundations of Situation Theory*, at ESSLLI'91, Saarbrücken, August 1991.

*Generalized Quantifiers and Natural Language*, at the CSLI Summer School, Stanford University, July 1985.

## Editorial Positions

Editor-in-Chief, *Journal of Logic, Language, and Information*, 2017–present.  
Editorial Board, Studia Logica book series “Outstanding Contributions to Logic”, 2013–present.  
Editor, *Journal of Logic, Language, and Information*, 1996–2011.  
Editor, *Logical Methods in Computer Science*, 2004–present.  
Editorial Board, the *Review of Symbolic Logic*, 2007–2014.  
Editorial Board, the *Notre Dame Journal of Formal Logic*, 1992–2011.  
Editorial Board, *Grammars*, 1996–present.  
Editorial Board, *Research on Language and Computation*, 1997–2010.  
Editorial Board, *Annals of Math., Computing and Teleinformatics*, 2003–present.  
Editorial Board, *Logic and Logical Philosophy*, 2005–present.

## Reviewing

I am very active as a referee for journals and conferences in mathematics, logic, and computer science. I occasionally also serve in this capacity for papers in philosophy; theoretical linguistics and computational linguistics, and mathematical psychology.

Here are some of the journals involved: *Artificial Intelligence*, *Notre Dame Journal of Formal Logic*, *Language, Information and Computation*, *Theoretical Computer Science*, *Journal of Symbolic Logic*, *Journal of Philosophical Logic*, *Lingua*, *Indiana Mathematics Journal*, *Studia Logica*, *Information and Computation*, *Journal of Mathematical Psychology*, and *Journal of Computational Linguistics and Language Technology*.

Textbook and research monograph consultant: The American Mathematical Society, Cambridge University Press, CSLI Publications, the Indiana University Linguistics Club, Houghton Mifflin, Harper-Collins, Blackwell, Oxford University Press, and Kluwer Academic Publishers.

Tenure evaluation for faculty members in Mathematics, Computer Science, Linguistics, or Philosophy: Technion Institute, New Mexico State University, UCLA, Carnegie-Mellon University, Johns Hopkins University, Oxford University, Illinois Wesleyan University, Chapman University. and Brooklyn College of CUNY.

Outside special assistance to the Philosophy Department of the University of Stockholm, concerning hiring of a Senior Lecturer, 2009-10.

Research grant proposal evaluator: NSF, Canadian NSF, UK EPSRC, Netherlands NWO, Israel Science Foundation, European Science Foundation, and Icelandic Research Fund. I evaluate proposals regularly.

## Academic Visits

CSLI Fellow, Stanford Center for the Study of Language and Information, Oct. 2015.  
Visiting Professor, Johns Hopkins University Cognitive Science Department, Fall 2000.

Visitor, University of Maryland Institute for Advanced Computer Studies, 2000-01.  
Visiting Research Scholar, Computer Science Department, CUNY Graduate Center, New York, 1995-96.  
Special Year Visitor, DIMACS, Rutgers University, 1995-96.  
Institute for Mathematical Sciences, Madras, India, July 1994.  
Mathematics Department, IBM T. J. Watson Research Center: several visits 1991-92. May 1991.  
Computer Science Department, CUNY Graduate Center: numerous visits 1992-94.  
Centre for Theoretical Studies, Charles University, Prague, Czechoslovakia, July 1991.  
Mathematics Department, Tulane University, November 1988.  
Max-Planck-Institut für Psycholinguistik, Nijmegen, Netherlands, June-July 1984.

## Course Development

*Mathematics from Language.* Developed an undergraduate course on mathematical topics coming from linguistics. The course covers material on categorial grammars, formal semantics, and other topics. I am writing a textbook on this with Edward L. Keenan of UCLA.

*Model Theory for Applied Logic.* Developed a graduate course covering the basics of model theory, stressing logical systems of many varieties, and the completeness theorems for them. The course will lead to a textbook in this area.

*Mathematics and Logic for Cognitive Science.* A graduate class that I am developing, designed to give cognitive science graduate students background in mathematics. The course also attracts students from artificial intelligence and other areas. It covers probabilistic, neural net and symbolic approaches, emphasizing the theory more than the applications.

*Decidability.* This graduate class covered the decidability results of S1S and S2S, along with applications.

*Good and Bad Behavior with Mathematics.* This Hutton Honors College (undergraduate) class was part of Themseter 2012. The topics were the taken from game theory, networks, and voting theory.

*Recursion Theory.* I developed *text register machines* as a vehicle for presenting the Recursion Theorem, the  $s_n^m$  Theorem, and self-replicating computer programs. See [www.indiana.edu/~iulg/trm](http://www.indiana.edu/~iulg/trm)

*Coalgebra.* This graduate course was given twice, and it covers the basics of coalgebra. The last time around I used Bart Jacobs' draft textbook

*Modal Logic.* My graduate level modal logic course emphasizes epistemic logic and completeness theorems via canonical sentences. I have a draft textbook from it.

## Symposia Organized

Co-organizer, Symposium on Mathematical Statistics in Linguistics and Natural Language Processing, at the 2001 Meeting of the American Association for the Advancement of Science, San Francisco.

Co-organizer, Symposium on Finite State Methods in Linguistics and Computational Linguistics, held at the 2002 Meeting of the American Association for the Advancement of Science, Boston.

## Workshops Organized and Chaired

Natural Logic Meets Machine Learning, NALOMA'20, at NASSLLI 2020, Brandeis University.

Conference on Computing Natural Reasoning, collocated with WoLLIC, Bloomington, 2015.

Natural Logic in Computer Science (NLCS) all meetings. NLCS was held in 2013, '14, '15, '16, '18, and '19. Co-organizer: Valeria de Paiva.

Reasoning and Interaction at NASSLLI (RAIN), June 2012. Co-Organizer: Patrick Blackburn.

Turing Symposium, Indiana U., May 2012. Co-organizer: Esfandiar Haghverdi.

Workshop on Inference from Text, at NASSLLI'10, June 2010. Co-organizer: Annie Zaenen.

Workshop on Quantum Logic Inspired by Quantum Computing, Indiana University, May 2009. Co-organizers: J. Michael Dunn and Zhenghan Wang.

Workshop on Decision Theory and Games, Indiana University, May 2008.

Workshop on Cognitive Science Instruction, Indiana University, June 2006.

These workshops were informal events, without submitted papers, refereed publications, etc. This contrasts with the conferences below, all of which had proper publications.

## Conferences Chaired

Theoretical Aspects of Rationality and Knowledge (TARK'19), Toulouse, 2019

WoLLIC'18: Workshop on Logic, Language, Information, and Computation, Bogotá, Colombia, July 2018.

CALCO'15: Algebra and Coalgebra in Computer Science, Nijmegen, 2015. Co-chair: Pawel Sobocinski.

AiML'12: Advances in Modal Logic, Copenhagen, 2012. Co-chair: Silvio Ghilardi.

CMCS'02: Workshop on Coalgebraic Methods in Computer Science, Grenoble, 2002.

FGMOL 2001: Conference on Formal Grammars/Mathematics of Language, co-chaired with Geert-Jan Kruijff and Dick Ohrle, Helsinki, August 2001.



ITALLC2: the Conference on Information-Theoretic Approaches to Logic, Language and Computation, London, July 1996. This conference was the successor to the “Situation Theory and Its Applications” conference series.

Association for Symbolic Logic meeting with the American Philosophical Association, co-chair, Kansas City, Spring 1994.

## Conference Program Committees

TTLM’22: Third Tsinghua Interdisciplinary Workshop on Logic, Language, and Meaning: Dynamics in Logic and Language.

LACL’21: Logical Aspects of Computational Linguistics.

ESSLLI’22: European Summer School in Logic, Language, and Information, Galway, Ireland. (I am PC Chair.)

WoLLIC’20: Workshop on Logic, Language, Information, and Computation.

NASSLLI 2020: North American Summer School in Logic, Lang., and Information.

Workshop on Linguistic Complexity at COLING 2020

AiML’20, Helsinki, Finland, August 2020.

TTLM’20: Second Tsinghua Interdisciplinary Workshop on Logic, Language, and Meaning: Monotonicity in Logic and Language

LFCS’20: Logical Foundations of Computer Science, Deerfield Beach, Florida, January 2020.

LOFT2020: Logic and Found’s of Game and Decision Theory.

WeSSLLI Student Session (held on zoom), 2020

(Reviewer) 58th Annual Meeting of the Association for Computational Linguistics

(Reviewer) 1st Conference of the Asia-Pacific Chapter of the ACL and the 9th International Joint Conference on NLP

FOSSACS 2020 (subreviewer)

MOL 2019: Mathematics of Language.

CALCO 2019: Algebra and Coalgebra in Computer Science.

TARK19 (chair)

NLCS’19: Natural Language in Computer Science

IWCS 2019: International Workshop on Computational Semantics.

\*SEM’19: The Eighth Joint Conference on Lexical and Computational Semantics (reviewer for the Theoretical and Formal Semantics track)

ACL 2019: The 57th Annual Meeting of the Association for Computational Linguistics (reviewer).

CogSci’19: Cognitive Science Society (reviewer).

AiML’18, Advances in Modal Logic, Bern, Switzerland, August 2018.

NLCS’18, Natural Language in Computer Science Oxford UK, July 2018.

Cognitive Science Society, Madison, WI, July 2018.

LOFT'18, Milan, Italy, July 2018.  
 CMCS'18, Thessaloniki, April 2018.  
 LFCS 2018, Deerfield NY, January 2018.  
 (SCiL) Society for Computation in Linguistics, Salt Lake City, Jan. 2018.  
 International Workshop on Computational Semantics, Montpellier, France, Sept. 2017.  
 CALCO'17, Slovenia, June 2017.  
 Mathematics of Language (MoL'17), London, 2017.  
 International Conference on Topics in Theoretical Computer Science (TTCS 2017)  
 Topology, Algebra, and Categories in Logic (TACL'17), Prague, June 2017.  
 AI aspects of Reasoning, Information, and Memory 2016 (AIRIM'16)  
 Workshop on Logic, Language, Information, and Computation (WoLLIC'16), Puebla,  
 Mexico, July 2016.  
 Logical Aspects of Computational Linguistics (LACL'16), Nancy, 2016.  
 Logic and Found's of Game and Decision Theory (LOFT'16), Maastricht, July, '16.  
 PUaNLP (partiality, underspecification, and NLP) at ICAART, Rome, 2016.  
 Logical Foundations of Computer Science (LFCS '16), January 2016 in Boca Raton.  
 Special session on Languages, Information, and Computational Intelligence IEEE TEN-  
 CON, November 2015 in Macau.  
 Type Theory and Lexical Semantics (TyTLES'15), held with ESSLLI'15, Barcelona,  
 2015.  
 5th International Conference on Logic, Rationality and Interaction (LORI-V), to be held  
 October 2015 at Taiwan National University in Taipei, Taiwan.  
 Topics in Theoretical Computer Science (TTCS 2015), Teheran, August 2015.  
 Topology, Algebra, and Categories in Logic (TACL'15), Ischia Island, Italy, June 2015.  
 Student Session of EASLLC 2014, Beijing, 2014.  
 2nd Workshop on Continuous Vector Space Models and their Compositionality, EACL,  
 Gothenburg, Sweden, 2014.  
 Type Theory and Natural Language Semantics Workshop, EACL, Gothenburg, Sweden,  
 2014.  
 Advances in Modal Logic (AiML'14), Groningen NL, August 2014.  
 Workshop on Vector-Based Semantics, Theory an Application, ACL, Baltimore, June  
 2014.  
 Information, Languages, Computing: New Technologies, at AMT-BHI'13, Maebashi,  
 Gumma, Japan, Oct. 2013. This one got cancelled.  
 Algebra and Coalgebra in Computer Science (CALCO'13), Warsaw, Sept. 2013.  
 The Tenth Tbilisi Symposium on Logic, Language, and Computation (TbiLLC'13),  
 Georgia in Sept. 2013.  
 Logic in Computer Science (LICS'13), New Orleans, June 2013.  
 Logical Foundations of Computer Science (LFCS '13), January 2013 in San Diego.  
 Theoretical Aspects of Rationality and Knowledge (TARK'13), January 2013, in Chen-  
 nai, India.

Computability in Europe (CiE), Cambridge, part of the Alan Turing Year, June 2012.  
 Coalgebraic Methods in Computer Science (CMCS'12), Tallinn, Estonia, March 2012.  
 Mathematics of Language 12 (MoL'11), Tokyo, September 2011.  
 Algebra and Coalgebra in Computer Science (CALCO'11), Winchester, Sept. 2011.  
 Advances in Modal Logic (AiML'10), Steklov Math. Institute, Moscow, August 2010.  
 Logic and the Found's of Game and Decision Theory (LOFT'10), Toulouse, July 2010.  
 Association for Computational Linguistics (ACL'10), Uppsala, Sweden, July 2010. Area:  
 Mathematical linguistics and grammatical formalisms.  
 Algebraic Methodology and Software Technology (AMAST'10), Lac-Beauport, Quebec,  
 June 2010.  
 Coalgebraic Methods in Computer Science (CMCS'10), Paphos, Cyprus, as part of  
 ETAPS, March 2010.  
 Second International Workshop on Logic, Rationality and Interaction (LORI-II), Chong-  
 quing, China, October 2009.  
 Algebra and Coalgebra in Computer Science (CALCO'09), Udine, September 2009.  
 11th Meeting on the Mathematics of Language (MoL'09), U. Bielefeld, August 2009.  
 14th Conference on Formal Grammar (FG'09), Bordeaux, July 2009.  
 6th Midwest Computational Linguistics Colloq. (MCLC), Bloomington, May 2009.  
 Third Indian Conference on Logic and its Applications (ICLA), Institute of Mathemat-  
 ical Sciences, Chennai, January 2009.  
 Advances in Modal Logic (AiML'08), Nancy, France, September 2008.  
 Formal Grammars (FG'08), Hamburg, August 2008.  
 Logic and Foundations of Decision Theory (LOFT'08), Amsterdam, July 2008.  
 Algebraic Methodology and Software Technology (AMAST'08), Urbana, July 2008.  
 5th Midwest Computational Linguistics Colloq. (MCLC), East Lansing, May 2008.  
 Coalgebraic Methods in Computer Science (CMCS'08), Budapest, April 2008.  
 Algebra and Coalgebra in Computer Science (CALCO'07), Bergen, August 2007.  
 Formal Grammar (FG-12, at ESSLLI '07), Dublin, August, 2007.  
 Model-Theoretic Syntax at 10 (at ESSLLI '07), Dublin, August 2007.  
 Track B of the 34th International Colloquium on Automata, Languages and Program-  
 ming (ICALP'07), Wroclaw (Poland), July 2007.  
 Workshop on Logic, Language, Information, and Computation (WoLLIC'07), Rio de  
 Janeiro, July 2007.  
 Association for Symbolic Logic Spring Meeting, held in conjunction with the American  
 Philosophical Association, Chicago, April 18-21, 2007.  
 Formal Grammar (FG10), Malaga, Spain, August 2006.  
 Workshop on Rationality and Knowledge, Malaga, Spain, August 2006.  
 ESSLLI'06 PC member for Logic and Language, Malaga, Spain, August 2006.  
 Fifteenth Amsterdam Colloquium (AC'05), December 2005.  
 Logic in Computer Science (LICS'2005), Chicago, June 2005.

Algebra and Coalgebra in Computer Science (CALCO), University of Wales, Swansea, September 2005.

Workshop on Psycho-computational Models of Human Language Acquisition, associated with COLING 2004.

The Midwest Computational Linguistics Colloquium, Indiana U., June 2004.

The 12th International Congress for Logic, Methodology and Philosophy of Science, Section A2 (Philosophical Logic), Oviedo, Spain, 2003.

AiML (Advances in Modal Logic), Toulouse, France, September 30 - October 2, 2002.

6th International Workshop on Tree Adjoining Grammar and Related Formalisms (TAG + 6), University of Venice, Italy, May 2002.

Workshop on Semantic Complexity in Natural Language Processing Systems, Seattle, April, 2000.

ASM (Abstract State Machine) Workshop, Switzerland, March 2000.

Workshop on Coalgebraic Methods in Computer Science (CMCS), First–Ninth Meetings, held biannually 1997–2006.

Meeting on Mathematics of Language (MoL): Fourth, Fifth, and Sixth biannual Meetings, August 1995–2001.

Eleventh Amsterdam Colloquium (AC 97), December, 1997.

Association for Symbolic Logic meeting, Baltimore, January 1998.

Program Committee, Student Session at the Ninth European Summer School in Logic, Language, and Information, Aix-en-Provence, August 1997.

Fourth Workshop on Logic, Language, Information, and Computation (WoLLIC), Fortaleza, Brazil, July 1997.

ASL/LSA Conference on Logic and Linguistics, 1993.

## **Service: Indiana University**

Co-chair, Task Force on Graduate Student Mental Health. This committee was appointed by Dean Wimbush to advise IU on resources related to the pandemic and to graduate student mental health more generally.

Member, Graduate Faculty Council 2019-21. The GFC represents all eight campuses of IU.

Member, Themester 2020 Committee, 2019–20.

Member, Undergraduate Computing Task Force, College of Arts and Sciences, 2018–19.

Member, Language Science Research Initiative Task Force Task Force, 2019.

Proposer, Grand Challenge on “Language in the 21<sup>st</sup> Century”, IU Office of the Vice President for Research, 2015.

Director of Graduate Studies, Cognitive Science Program, beginning 2015.

Principal Host, Rabbi Arik Ascherman, Branigan Lecturer supported by the Institute for Advanced Studies. November 2014

Faculty Advisor, Baha'i Students Association, 2014-present.

Co-director of the IU Math Department's Research Experiences for Undergraduates (REU) Program. NSF grant 1156515: REU Site: Research Experiences for Undergraduates in Mathematics in Indiana University. My co-PI for the grant and co-director for the program was Chris Connell.

Hiring Committee for joint position in Cognitive Science and Philosophy, Spring 2014.

Hutton Honors College Admissions Committee, 2013–14.

Host for Vincent Hendricks as part of Themester, including arrangements of a noted Danish film at the IU Cinema, October 2013.

Co-host for Neil Jones, Distinguished guest in Computer Science, October, 2013.

Host for Distinguished Lecturer in the Mathematics Department, Jiří Adámek, 2010.

Cognitive Science Graduate Admissions Committee, 2005-07, 2008-09.

Cognitive Science Steering Committee, 1998-present.

School of Informatics Search Committee, 2001-2004.

Computational Linguistics/Cognitive Science Hiring Committee, 2001-06.

Bloomington Faculty Council, 1998-2000. Elected position from across the campus.

Student Affairs Committee of IU Bloomington, 1999-2000.

IU Bloomington Educational Policies Committee, 1998-1999.

Advisory Board of the School of Informatics, 1999-2000. The Advisory Board worked on the initial plans for the school.

Chair, Math Department Committee on New and Innovative Courses, 1998-2000. These courses were developed as part of the IU-wide initiative called Mathematics Across the Curriculum.

Logic Coordination Committee, College of Arts and Sciences, 1991–present.

Director, Interdisciplinary Logic Seminar, 1992–93, 1997–98.

Supported in part by NSF grant DMS–85–01752, 1987–1988.

PI on NSF BCS-0083278, 2000-01; BCS-0237379, 2003-04; BCS-1019206, 2010-12.

Faculty Sponsor, Indiana University Undergraduate Mathematics Club, 1996–98.

Other Mathematics Department committees over the years: various tenure, promotion, and re-appointment committees; Putnam Exam, Undergraduate Support, Graduate Support, Web Pages, Departmental Lecturers, and Tier I Algebra Exam.

## **Service: the Academic Community**

Member, Accreditation Committee of the Master Logic Programme of the University of Amsterdam, 2020.

Member, Advisory Board of the University of Amsterdam-Tsinghua University Center for Excellence in Logic, 2019–present.

Vice-President, European Foundation for Logic, Language, and Information, 2016–present.

Member, international Consulting Board of the Laboratory for Perceptual and Cognitive Systems, Riga, Latvia, 2017–present. Also, member of the Rob Blumberg Prize Committee for the same Lab in Riga.

Vice-President of the Managing Board, European Foundation for Logic, Language, and Information, 2016–18.

Member, Steering Committee of the conference Topics in Theoretical Computer Science, 2014–present.

Member, Beth Dissertation Prize Committee, 2012–2018.

Program Committee, NASSLLI 2016, Rutgers.

Local Arrangements Co-chair, WoLLIC 2015, Bloomington.

Reviewer for the Philosophy Department of Stockholm University of eight candidates for a Senior Lectureship in Theoretical Philosophy, Especially Logic, 2010.

Local Arrangements Committee, NASSLLI 2010, Bloomington.

Director, Second North American Summer School in Logic, Language, and Information (NASSLLI'02). I am also a member of the Scientific Committee for NASSLLI, 2001–present. The first NASSLLI took place at Stanford University in June, 2002. NASSLLI 2003 was held at IU in June, 2003. I was chair of the program committee, and I am chair of NASSLLI's Steering Committee. NASSLLI was a major event with two collocated conferences (MoL and TARK). It attracted around 100 people.

External Evaluation Committee for the Graduate Program in Logic, Algorithms and Computation (MPLA) in Athens, Greece. The group met in Athens in 2005 and issued a report in 2007 that was part of the ten-year evaluation and renewal of the MPLA.

The Association for the Mathematics of Language: Vice-President, 1997–1999, and President, 1999–2001. MOL is a special interest group of the Association for Computational Linguistics. Organized meetings, special issues of journals, and AAAS symposia.

Member, Coalgebraic Methods in Computer Science (CMCS) Steering Committee, 1997–present. This committee is responsible for organizing the annual meetings and for related work in the coalgebra community.

Member, CALCO Steering Committee, 2005–present. CALCO is a biannual conference including both CMCS (see above) and WADT (a conference on algebraic methods in computer science).

Advisory Board Member, *Advances in Modal Logic*, 1995–1999. This committee organizes a biannual meeting with the same name.

Member, FoLLI Dissertation Prize Committee, 1997–2005. We awarded an annual prize for the outstanding dissertation in language, logic and computation, now called the E. W. Beth prize.

Member, Committee to award a prize to the best student paper presented at the European Summer School in Logic, Language, and Information, August 1997.

Member, Evaluation Panel for the Center on Basic Research in Computer Science (BRICS) and for the Semiotic Research Center, (SRC), Danish National Research Foundation, May, 1997. This panel visited Denmark to evaluate the centers on matters pertaining to funding.

## Invited Lectures at Conferences

- Logic and Algorithms in Computational Linguistics 2021, online, December 2021. (I am a keynote speaker for this conference, held jointly with the LACL conference.)
- Second Tsinghua Interdisciplinary Workshop on Logic, Language, and Meaning: Monotonicity in Logic and Language, December 2020.
- Automated Reasoning in Quantified Non-Classical Logics (ARQNL'18), Oxford, July 2018.
- Logic, Games, and Society, meeting in honor of Rohit Parikh's 80th birthday, New York City, December 2016.
- Evening Keynote Address, ESSLLI 2016, Bolzano, Italy, August 2016.
- Southern Illinois University Mathematics Conference, Carbondale, May 2016.
- Logics for Social Behavior, Delft, June 2015.
- Jubilee Conference 125 years of mathematics and science in "St. Kliment Ohridski", Sofia Bulgaria, December 2014. I was an invited plenary speaker, and my talk was given by videoconference.
- Knowledge Representation (KR'2014), invited 3-hour tutorial on Dynamic Epistemic Logic, Vienna, Austria 20 July 2014.
- 17th Brazilian Logic Conference (EBL 2014) Petrópolis, Rio de Janeiro, April 7-11, 2014. (Lecture given by video from Bloomington.)
- Workshop in Honor of the 60th Birthday of Reinhard Muskens, Tilburg, Netherlands, December 2013. (Lecture given by video from Bloomington.)
- Logic in Computer Science (LiCS 2013)/Mathematical Foundations of Programming Semantics (MFPS'13) session on Coalgebra, New Orleans, June 2013.
- Workshop on Coalgebra, Bellairs Research Institute, Barbados, March 2013.
- Formal Grammar (FG'12), Opole, Poland, August 2012.
- Reasoning and Interaction at NASSLLI (RAIN), UT Austin, June 2012.
- Theoretical Aspects of Rationality and Knowledge (TARK'11), Groningen, the Netherlands, July 2011 (invited tutorial lecture).
- Semantics for Textual Inference, LSA Summer Institute Boulder, July 2011.
- Workshop on Natural Logic, CSLI, Stanford University, April 2011.
- VIG Logic Meeting in honor of Yiannis Moschovakis, UCLA, February 2011.
- Association for Symbolic Logic (ASL) Meeting with the American Math. Society, New Orleans, January 2011.
- AMS-MAA-MER Special Session on Mathematics and Education Reform at the Joint Math Meetings in New Orleans, January 2011.
- Association for Symbolic Logic (ASL) Annual Meeting, Washington DC, March 2010.
- Workshop on Natural Logic, 17th Amsterdam Colloquium (AC'09), December 2009.
- The End of Infinity (symposium), Amsterdam, December 2009.
- Indiana Philosophical Association, Bloomington, IN, December 2009.

Boolean Algebras, Lattices, Algebraic Logic, Quantum Logic, Universal Algebra, Set Theory, Set-theoretic Topology and Point-free Topology (BLAST'10), Las Cruces, NM, August 2009.

Advances in Modal Logic, Nancy, France, September 2008.

Workshop on Model Theoretic Syntax at 10, part of ESSLLI, Dublin, August 2007.

Workshop on Coalgebraic Logic, part of TANCL, Oxford University, August 2007.

Mathematics of Language meeting, UCLA, July, 2007.

International Conference on Order, Algebra, and Logics, Vanderbilt U., June 2007.

Second Conference on Logic and its Relationship with Other Disciplines, IIT Bombay, January 10–12, 2007.

(Keynote Address) 11th International Conference on Algebraic Methodology and Software Technology, AMAST'06, Kuressaare, Estonia, 5-8 July 2006.

Festschrift Symposium in Honor of Joseph Goguen, UCSD, June 27-29 2006.

Symposium on Infinite Objects: Modeling, and Reasoning, Amsterdam, March 2006.

Advances in Modal Logic 2006. (Unfortunately, I had to decline this invitation.)

Fifteenth Amsterdam Colloquium AC'05, December 2005.

Fifth Panhellenic Logic Symposium, PLS'05, Athens, July 2005.

New York City Logic Conference, May 20-21, 2005.

Fest Colloquium for Uwe Mönnich, Freudenstadt, November 2004.

(Presentation to the Logic School), ILLC, Utrecht, Netherlands, June 2004.

Assn. for Symbolic Logic/American Philosophical Assn., Minneapolis, May 2001.

Mid-Atlantic Mathematical Logic Seminar (MAMLS), Washington DC, April 2001.

Workshop on Logic and Games, Groningen, November 2000.

CSLI Workshop on Logic, Language, and Information, April 2000.

Workshop on Logic, Language, Information, and Computation (WoLLIC), Recife, Brazil, July 1995.

Logic At Work Conference, Amsterdam, December 1992.

Mathematical Aspects of Information Structures, Abingdon, UK, April 1992.

Workshop on Information Structures, Amsterdam, December 1991.

VIG Logic Meeting, UCLA, January 1991.

New England Set Theory Seminar, Amherst, April 1989.

## Other Conference and Seminar Presentations

University of Wisconsin Logic Seminar (via zoom), November 2021.

Applied Category Theory (zoom, presented by my co-author Victoria Noquez), July 2021.

International Conference on Thinking, Paris (via zoom), July 2021.

Logic Colloquium, University of Connecticut Logic Group (via zoom), April, 2021.



OCIE Seminar in the History and Philosophy of Mathematics and Logic (via zoom), October 2020.

CLASP Seminar, Centre for Linguistic Theory and Studies in Probability, Gothenburg, Sweden, May 2019.

Computer Science Colloquium, CUNY Graduate Center, New York City, May 2019.

Philosophy Department Colloquium, Carnegie-Mellon University, November 2018.

Mathematics Department Seminar, U. of the Andes, Bogotá, Colombia, July 2018.

Natural Logic in Computer Science, Oxford, July 2018.

Bridging2018 (Bridging the Gap between Human and Automated Reasoning), Stockholm, July 2018.

Computer Science seminar, Friedrich-Alexander Universität Erlangen-Nürnberg, July 2018.

Mathematics of Language, London, July 2017.

University of Notre Dame Logic Seminar, November 2016.

University of Pennsylvania Logic Seminar, March 2016.

(with Alexandra Silva and Chung-chieh Shan) Coalgebraic Trace Semantics for Probabilistic Processes: Preliminary Proposal, to be presented at the in POPL workshop on Probabilistic Programming Semantics, January 2016.

Tufts University Cognitive Science Colloquium, November 2015.

CUNY Graduate Center Computer Science Colloquium, November 2015.

New York City Category Theory Seminar, November 2015.

Stanford Philosophy Department Workshop on Ancient Logic, October 2015.

nuSVN Seminar, Nuance Corporation, Sunnyvale CA, October 2015.

Stanford University Logic Seminar, October 2015.

UC Berkeley Logic Seminar, October 2015.

Stanford-UC Berkeley Logic Circle, October 2015.

Workshop on NLP and Automated Reasoning, September 2015.

University of Amsterdam Algebra|Coalgebra Seminar, July 2015.

University of Chicago Logic Seminar, November 2014.

Queen Mary University, London, Computer Science Theory Seminar, July 2014.

Topology, Algebra, and Categories in Logic (TACL'13), Nashville TN, July 2013.

Scandinavian Logic Symposium, Roskilde, Denmark, August 2012.

Imperial College Logic In Computing Seminar, London, August 2012.

Invited talk to Thomas Icard's course on Natural Logic at NASSSLI, June 2012.

Technical University of Braunschweig Theoretical CS Colloquium, July 2011.

University of Illinois Champaign-Urbana Logic Seminar, March 2011.

Indiana University Informatics Colloquium, October 2010.

Indiana University Advanced College Project invited lecture, October 2010.

Indiana University Computational Linguistics talk series, March 2010.

U. of Birmingham (UK) School of Computer Science Theory Seminar, July 2008.

Proof Theory at the Syntax/Semantics Interface, workshop in the Linguistic Society of America Summer Institute, Cambridge, MA, July 2005.  
 George Washington University Mathematics Colloquium, May 2001.  
 University of Maryland CS Department Theory Seminar, March and May 2001.  
 Johns Hopkins University Computer Science Colloquium, January 2001.  
 University of Maryland Logic and AI Seminar, November 2000 and February 2001.  
 Tulane University Mathematics Colloquium, New Orleans, November 1999.  
 University of Illinois, Chicago, Logic Seminar, October 1999.  
 University of Maryland Logic Seminar, College Park, October 1999.  
 Mathematical Foundations of Programming Semantics meeting, New Orleans 1999.  
 Theoretical Aspects of Rationality and Knowledge meeting, Chicago, 1998.  
 Carnegie Mellon University Philosophy Department Logic Seminar, December, 1997.  
 Institute for Mathematical Sciences Seminar, Madras, India July, 1994.  
 CUNY Graduate Center Applications of Logic Seminar, June, 1993.  
 UCLA Mathematics Department PIC seminar, UCLA, May, 1993.  
 Ohio State University Logic Seminar, May, 1993.  
 Third Meeting on Mathematics of Language, Austin, November 1992.  
 Workshop on Feature Logics, Inheritance and Types, Saarbrücken, August 1991.  
 Centre for Theoretical Studies Colloquium, Charles University, Prague, July 1991.  
 Manchester University Computer Science Department Colloquium, July 1991.  
 IBM T. J. Watson Research Center Mathematics Department Seminar, May 1991.  
 Second Meeting on Mathematics of Language, Tarrytown, NY, May 1991.  
 Workshop on Semantics of Programs and Model Theory, Schloss Dagstuhl, June 1991.  
 Conference on Linguistics and Computation, UIUC, April 1991.  
 MSRI Workshop on Logic From Computer Science, Berkeley, November 1989.  
 Hardware Methods Group, Indiana University CS Department, November 1990.  
 Colloquium, Indiana University Mathematics Department, April 1990.  
 Colloquium, University of Illinois at Chicago Mathematics Department, April 1990.  
 Colloquium, Syracuse University Computer Science Department, April 1990.  
 Seminar speaker (several), CUNY Graduate Center Logic Seminar, Jan.–May, 1990.  
 Computer Science Logic meeting, Kaiserslautern, Germany, October 1989.  
 Situation Theory and Situation Semantics Conference, Asilomar, March 1989.  
 Math Foundations of Programming Semantics Conference, Tulane U., March 1989.  
 Colloquium speaker, Tulane University Mathematics Department, November 1988.  
 Sixth Int'l. Conf. on the Theory and Applications of Graphs, Kalamazoo, June 1988.  
 Conf. on Universal Algebra, Algebraic Logic, and Computer Science, Ames, May 1988.  
 Conference on Category Theory and Computer Science, Edinburgh, September 1987.  
 Invited participant to the Workshop on Mathematical Theories of Language, Stanford University, July–August, 1987. Supported by AAAI and LSA.

Conference on Generalized Quantifiers, Lund, March 1985.

UC Berkeley Logic Seminar, February 1985.

Calif. State University at Los Angeles Mathematics Department Seminar, March 1984.

## Research Books

Jon Barwise and Lawrence S. Moss, **Vicious Circles: On the Mathematics of Non-Wellfounded Phenomena** CSLI Lecture Notes Number 60, CSLI Publications, Stanford University, 1996. 390 p.

Edward L. Keenan and Lawrence S. Moss, **Mathematical Structure in Language**. CSLI Lecture Notes Number 218, CSLI Publications, Stanford University, 2016, 473pp.

Jiří Adámek, Stefan Milius, and Lawrence S. Moss, **Initial Algebras, Terminal Coalgebras, and the Theory of Fixed Points of Functors**. Book in progress, 2021, 500 pp. See <https://www8.cs.fau.de/ext/milius/publications/files/CoalgebraBook.pdf>.

## Edited books

**Rohit Parikh on Logic, Language and Society**, edited by Can Baskent, L. S. Moss, and R. Ramanujam. Springer Outstanding Contributions to Logic, 2017. ISBN 978-3-319-47843-2.

**Partiality and Underspecification in Information, Languages, and Knowledge**, edited by Henning Christiansen, M. Dolores Jiménez-López, Roussanka Loukanova, and L. S. Moss Cambridge Scholars Publishing, 2017. ISBN 978-1-4438-7947-7

## Textbooks

**1#: a Text Register Machine Introduction to Computability Theory**, web textbook with web interface and Java applet, available at [www.indiana.edu/~iulg/trm/](http://www.indiana.edu/~iulg/trm/).

**Logic from Language**, textbook on topics in logic motivated by natural language inference, in preparation.

**Invitation to Possible Worlds**, textbook on modal logic, in preparation.

## Handbook Chapters

Each of the articles listed below was invited and then refereed. Each summarizes one or more entire research areas thus serves as a standard reference on its topics. The aim of such articles is introduce the areas to outsiders and to take readers to the forefront of research.

1. (with Jerry Seligman) Situation Theory, Chapter 4 of J. van Benthem and A. ter Meulen (eds.), *Handbook of Logic and Language*, Kluwer Acad. Publishers, 1996, pp. 239–309.
2. (with Hans-Jörg Tiede), Applications of Modal Logic in Linguistics, Ch. 19 of P. Blackburn, J. van Benthem, and F. Wolter (eds.), *Handbook of Modal Logic*, Elsevier, 2007, 299–341.
3. (with Rohit Parikh and Chris Steinsvold) Topology and Epistemic Logic, Chapter 6 of M. Aiello, I. Pratt-Hartmann, and J. van Benthem (eds.), *Handbook of Spatial Logics*, Springer, 2007, 299–342.

4. (with Alexandru Baltag and Hans van Ditmarsch) Epistemic Logic and Information Update, P. Adriaans and J. van Benthem (eds.), *Handbook of the Philosophy of Information*, Elsevier, 2008, 369–463.
5. The Role of Mathematical Methods, in D. G. Fara and G. Russell (eds.), *Routledge Companion to the Philosophy of Language*, Routledge, 2011, 533–543.
6. Natural Logic, in C. Fox and S. Lappin (eds.), *Handbook of Contemporary Semantic Theory, Second Edition*, Wiley-Blackwell Publishing, 2015, 646–681.
7. Dynamic Epistemic Logic, in H. van Dittmarsch, J. Halpern, W. van der Hoek, and B. Kooi (eds.), *Handbook of Logics for Knowledge and Belief*, College Publications, 2015, 253–297.

## Encyclopedia Entry

The Stanford Encyclopedia of Philosophy is one of the main resources in all of philosophy. Since it is on the web, it is widely used.

1. Non-wellfounded Set Theory, *Stanford Encyclopedia of Philosophy*, 2008, 42 pp.  
<http://plato.stanford.edu/entries/nonwellfounded-set-theory/>

## Research Publications: Articles

All papers are refereed except where noted (papers 11, 31, 40, 50, 52, 58, 59, 62, 68, and 79). Also, in cases where a paper appeared in a conference proceedings and then a journal, the list below generally lists the two publications as one item (papers 9, 27, 35); But when there is a substantial difference, the papers are listed separately (papers 25 and 41).

It is an honor to have papers in special issues of journals, and this is the case for papers 9, 23, 26, 41, 44, 49, 55, 56, and 65. These include issues in honor of the following people, Jiří Adámek, Jon Barwise, Johan van Benthem, Joseph Goguen, Yuri Gurevich, Dexter Kozen, Uwe Mönnich, and Rohit Parikh.

The end of this list contains work in progress.

1. (with Edward L. Keenan) Generalized Quantifiers and the Logical Expressive Power of Natural Language. In M. Cobler, et al (eds.), *Third West Coast Conference on Formal Linguistics*, Stanford Linguistics Association, 1984, pp. 149–157.
2. (with Edward L. Keenan) Generalized Quantifiers and the Expressive Power of Natural Language. Chapter 4 of van Benthem, J. and A. ter Meulen (eds.), *Generalized Quantifiers in Natural Language*, Groningen-Amsterdam Series in Semantics No. 4, Foris, 1985, pp. 73–124.
3. Existence and Nonexistence of Universal Graphs. *Fundamenta Mathematicae* 133 (1990), pp. 129–141.
4. (with Satish R. Thatte) Generalization of Final Algebra Semantics by Relativization. In M. Main, et al (eds.), *Proceedings, Mathematical Foundations of Programming Semantics*, Springer LNCS 422, 1990, pp. 284–300.

5. (with Satish R. Thatte) Optimal Semantics of Data Type Extensions. In C. Bergman, et al (eds.), *Proceedings, Algebraic Logic and Universal Algebra in Computer Science*, Springer LNCS 425, 1990, pp. 161–180.
6. (with Michael W. Mislove and Frank J. Oles) Partial Sets. In R. Cooper, et al (eds.) *Situation Theory and Its Applications*, vol. 1, CSLI Lecture Notes 22, 1990, pp. 117–131.
7. (with Yuri Gurevich) The Operational Algebraic Semantics of Occam. In E. Börger, et al (eds.), *Proceedings of the Second Computer Science Logic Symposium*, Springer LNCS vol. 440, 1990, pp. 176–192.
8. The Universal Graphs of Fixed Finite Diameter. In Y. Allavi, et al (eds.), *Graph Theory, Combinatorics, and Applications*, Volume 2, John Wiley & Sons, 1991, pp. 923–937.
9. (with Michael W. Mislove and Frank J. Oles) Non-Well-Founded Sets Modeled As Ideal Fixed Points. *Information and Computation* 93, No. 1 (1991), 16–54, special issue on selected papers from LICS '89. Preliminary version appears in the proceedings of LICS '89, IEEE, pp. 263–272.
10. Completeness Theorems for Logics of Feature Structures. In Y. N. Moschovakis (ed.), *Logic From Computer Science*, MSRI Pubs. Vol. 21, Springer-Verlag, 1991, pp. 387–403.
11. (with Jon Barwise) Hypersets. *The Mathematical Intelligencer*, 13, No. 4 (1991), 31–41. (unrefereed paper)
12. (with José Meseguer and Joseph A. Goguen) Final Algebras, Cosemicomputable Algebras, and Degrees of Unsolvability. *Theoretical Computer Science* 100 (1992), 267–302.<sup>1</sup> It also appears in D.H. Pitt, et al (eds.), *Conference on Category Theory and Computer Science*, Springer LNCS 283, 1987, pp. 158–181.
13. Distanced Graphs. *Discrete Mathematics* 102, No. 3 (1992), pp. 287–305.
14. (with Rohit Parikh) Topological Reasoning and the Logic of Knowledge (Preliminary Report), in Y. Moses (ed.), *Proceedings of TARK IV*, Morgan Kaufmann, 1992.
15. (with Satish R. Thatte) Modal Logic and Algebraic Specifications. *Theoretical Computer Science* 111, No. 1–2, (1993), pp. 191–210.
16. (with David E. Johnson) Some Formal Properties of Stratified Feature Grammars. *Annals of Artificial Intelligence and Mathematics*, vol. 8, 1993, pp. 133–173.
17. (with David E. Johnson and Adam Meyers) Parsing With Relational Grammar. *Proc., 31st Annual Meeting of the Assoc. for Computational Linguistics*, 1993, pp. 97–104.
18. (with David E. Johnson) An Overview of Stratified Feature Grammar. In C. Martin-Vide (ed.), *Current Issues in Mathematical Linguistics*, Elsevier, Amsterdam, 1994, 103–199.
19. (with Jerry M. Seligman) Classification Domains and Information Links: Theory and Applications. In J. van Eijck and A. Visser (eds.), *Logic and the Flow of Information*, Kluwer Academic Publishers, Studies in Logic, Language and Information, 1994, 112–124.

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<sup>1</sup>This paper is a TCS “Fundamental Study.”

20. (with David E. Johnson) Generalizing Feature Structures for Multistratal Relational Analyses. In J. Cole, et al (eds.), *Linguistics and Computation*, CSLI Lecture Notes Number 52, CSLI Publications, 1995, 29–84.
21. (with David E. Johnson) Evolving Algebras and Mathematical Models of Language. In M. Masuch and L. Polos (eds.), *Applied Logic: How, What, and Why*, Kluwer, 1995, pp. 143–176.
22. (with David E. Johnson) Grammar Formalisms Viewed as Evolving Algebras. In *Linguistics and Philosophy*, special issue on selected papers from MOL4, vol. 17, 1995, pp. 537–560.
23. (with David E. Johnson) A Dynamic View of Constraint-Based Formalisms. *Journal of Logic, Language, and Information*, special issue on Static and Dynamic Aspects of Syntactic Structures, vol. 4, no. 1, 1995, pp. 61–79.
24. Power Set Recursion. *Annals of Pure and Applied Logic*, 71 (1995), pp. 247–306.
25. (with Andrew Dabrowski and Rohit Parikh) Topological Reasoning and the Logic of Knowledge. *Annals of Pure and Applied Logic* 78 (1996), no. 1-3, papers in honor of the Symposium on Logical Foundations of Computer Science, “Logic at St. Petersburg” (St. Petersburg, 1994), 73–110. A much-expanded version of paper 14.
26. (with Norman Danner) On the Foundations of Corecursion. *Logic Journal of the IGPL*, Vol. 5, No. 2 (1997) (Special issue on papers from the 5th Workshop on Logic, Language, and Information), pp. 231–257.
27. (with Jon Barwise) Modal Correspondence for Models, the *Journal of Philosophical Logic*, Vol. 27 (1998), 275–294. Preliminary version in P. Dekker et al (eds.) *Proceedings of the Tenth Amsterdam Colloquium*, 1996.
28. (with A. J. C. Hurkens, Monica McArthur, Yiannis N. Moschovakis, and Glen Whitney) The Logic of Recursion Equations, the *J. Symbolic Logic*, Vol. 63, No. 2 (1998), 451–478.
29. (with Alexandru Baltag and Sławomir Solecki) The Logic of Common Knowledge, Public Announcements, and Private Suspicions, *Proceedings of TARK-VII (Theoretical Aspects of Rationality and Knowledge)*, 1998.
30. Coalgebraic Logic, in Festschrift on the occasion of Professor Rohit Parikh’s 60th birthday. *Annals of Pure and Applied Logic* 96 (1999), no. 1-3, 277–317. The last sections of this publication appear with lots of blank spaces due to a bug in the printing process, and they re-appear in the same journal: vol. 99 (1999) no. 1–3, 241–259.
31. From Hypersets to Kripke Models in Logics of Announcements. In *JFAK. Essays Dedicated to Johan van Benthem on the Occasion of his 50th Birthday*, Vossiuspers, Amsterdam University Press, 1999. (unrefereed paper, but one with results).
32. (with Andrew Dabrowski) The Johnson Graphs Satisfy a Distance Extension Property, *Combinatorica*, 20 (2), 2000, 295–300.
33. Parametric Corecursion, *Theoretical Computer Science* 260 (1–2), 2001, 139–163.

34. Simple Equational Specifications of Rational Arithmetic, *Discrete Mathematics and Theoretical Computer Science*, Volume 4, no. 2 (2001), 291–300.
35. Recursion and Corecursion Have the Same Equational Logic, *Theoretical Computer Science* 294 (2003), no. 1–2, 233–267. Preliminary version in the *Proc. of the 15th Meeting on Mathematical Foundations of Programming Semantics*, ENTCS, Vol. 20, Elsevier, 1999.
36. (with Ignacio Viglizzo) Harsanyi Type Spaces and Final Coalgebras Constructed from Satisfied Theories, in J. Adámek and S. Milius (eds.), *Proceedings of the 7th Meeting on Coalgebraic Methods in Computer Science*, ENTCS vol. 106, 279–295, 2004.
37. (with Alexandru Baltag) Logics for Epistemic Programs, *Synthese*, Vol. 139, issue 2 (2004), 165–224. (This is in *Synthese*'s section *Knowledge, Rationality, and Action*.) Reprinted in W. van der Hoek (ed.), *Information, Interaction, and Agency*, Springer-Verlag, 2005.
38. (with Joseph S. Miller) The Undecidability of Iterated Modal Relativization, *Studia Logica*, vol. 79, 373–407, 2005.
39. (with J. Michael Dunn, Tobias J. Hagge, and Zhenghan Wang) Quantum Logic as Motivated by Quantum Computing, *Journal of Symbolic Logic* vol. 70, no. 2, 353–359, 2005.
40. Applied Logic: A Manifesto, in D. Gabbay, S. Goncharov, and M. Zakharyashev (eds.) *Mathematical Problems from Applied Logics I: New Logics for the XXIst Century*, Springer International Mathematical Series, 2006, 23 pp. (unrefereed paper)
41. (with Ignacio Viglizzo) Final Coalgebras for Measurable Spaces. *Information and Computation*, Volume 204, Issue 4 (April 2006) (special issue on selected papers from CMCS'04), 610–636. (This is an enlarged version of most of item 36.)
42. Recursion Theorems and Self-Replication Via Text Register Machine Programs. *Bulletin of the European Association for Theoretical Computer Science*, Number 89, 2006, 171–182.
43. Uniform Functors on Sets, in K. Futatsugi, J.-P. Jouannaud, and J. Meseguer (eds.), *Algebra, Meaning, and Computation: A Festschrift in Honor of Prof. Joseph Goguen*, Springer-Verlag LNCS 4064, 2006, 420–448.
44. (with Stefan Milius) The Category Theoretic Solution of Recursive Program Schemes. *Theoretical Computer Science*, Volume 366, Issues 1–2, November 2006, pp. 3–59, special issue on papers presented at CALCO'05.<sup>2</sup> Preliminary version published in J. L. Fiadero et al (eds.) the *Proc. CALCO'05 (First Conference on Algebra and Coalgebra in CS)*, Springer LNCS 3629, 2005, 293–312.
45. Finite Models Constructed From Canonical Formulas. *Journal of Philosophical Logic*, vol. 36, no. 6, 2007, 605–640.
46. (with Stefan Milius) Corrigendum to paper 44, *Theoretical Computer Science*, Volume 403 (2008), no. 2-3, 409–415.

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<sup>2</sup>This paper is a TCS “Fundamental Study.”



47. Completeness Theorems for Syllogistic Fragments, in F. Hamm and S. Kepser (eds.) *Logics for Linguistic Structures*, Mouton de Gruyter, 2008, 143–173.
48. Confusion of Memory, *Information Processing Letters*, 107:3–4, 2008, 114–119.
49. (with Stefan Milius) Equational Properties of Recursive Program Scheme Solutions, *Cahiers de Topologie et Géométrie Différentielle Catégoriques* (special volume of in Honour of Jiří Adámek on the Occasion of his Sixtieth Birthday), 50 (2009), 23–66.
50. (with Guram Bezhanishvili) Undecidability of First-Order Logic, educational module for the NSF-sponsored project on Learning Discrete Mathematics and Computer Science via Primary Historical Sources (<http://www.cs.nmsu.edu/historical-projects/>), 26 pp, 2009.
51. (with Ian Pratt-Hartmann) Logics for the Relational Syllogistic, *Review of Symbolic Logic*, Vol. 2, No. 4, 2009, 647–683.
52. Natural Logic and Semantics, in M. Aloni et al (eds.), *Proceedings, 17th Amsterdam Colloquium*, LNAI 6042, 2010, 84–93. (unrefereed invited paper)
53. (with Stefan Milius and Daniel Schwencke) CIA Structures and the Semantics of Recursion, in C.-H. L. Ong (ed.), *Proc. FoSSaCS 2010*, LNCS v. 6014, 2010, 312–327.
54. Logics for Two Fragments Beyond the Syllogistic Boundary, in *Fields of Logic and Computation: Essays Dedicated to Yuri Gurevich on the Occasion of His 70th Birthday*, A. Blass, N. Dershowitz, and W. Reisig (eds.), LNCS, vol. 6300, Springer-Verlag, 2010, 538–563.
55. Syllogistic Logics with Verbs, *Journal of Logic and Computation*, special issue on papers from Order, Algebra and Logics, Vol. 20, No. 4, 2010, 947–967.
56. A Note on Expressive Coalgebraic Logics for Finitary Set Functors, in a special issue of the *Journal of Logic and Computation*, Vol. 20, No. 5, 2010, 1101–1111.
57. Syllogistic Logic with Complements, in J. van Benthem, A. Gupta, and E. Pacuit (eds.), *Games, Norms and Reasons: Logic at the Crossroads*, Springer Synthese Library Series, 2010, 185–203.
58. Intersecting Adjectives in Syllogistic Logic, in C. Ebert, G. Jaeger, and J. Michaelis, *Proc. MoL 10/11*, LNAI 6149, 2010, 223–237. (unrefereed invited paper)
59. Interview on Epistemic Logic, in O. Roy and V. Hendricks (eds.) *Epistemic Logic, 5 Questions*, Automatic Press /VIP, 2010. (unrefereed invited paper)
60. Syllogistic Logic with Comparative Adjectives, *J. Logic, Language, and Information* 20:3, 2011, special issue on papers from MoL 2007, 397–417.
61. (with Jiří Adámek, Stefan Milius, and Lurdes Sousa) Power-Set Functors and Saturated Trees, in M. Bezem (ed.) *Proc. Computer Science Logic 2011*, 5–19.
62. Connections of Coalgebra and Semantic Modeling, in K. Apt (ed) *Proceedings, TARK 2011*, 7 pp. (unrefereed invited paper)

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