

THE  
BULLETIN  
OF  
SYMBOLIC LOGIC

EDITED BY

ROD DOWNEY, Managing Editor

JOHN BALDWIN    ILIJAS FARAH    VOLKER HALBACH

MARTIN OTTO    MICHAEL RATHJEN

ERICH RECK    KATRIN TENT

REVIEWS EDITORS

ALASDAIR URQUHART, Reviews Managing Editor

STEVE AWODEY    JOHN BALDWIN    LEV BEKLEMISHEV

ANUJ DAWAR    MIRNA DŽAMONJA    DAVID EVANS

ERICH GRÄDEL    DENIS HIRSCHFELDT    HANNES LEITGEB

ROGER MADDUX    GRIGORI MINTS

VOLKER PECKHAUS    SŁAWOMIR SOLECKI

VOLUME 14 · NUMBER 2 · JUNE 2008

ISSN 1079-8986

PUBLISHED QUARTERLY BY THE ASSOCIATION FOR SYMBOLIC LOGIC, INC.  
WITH SUPPORT FROM INSTITUTIONAL MEMBERS

---

*Copyright ©2008 by the Association for Symbolic Logic. All rights reserved.  
Reproduction by photostat, photo-print, microfilm, or like process by permission only.*

## TABLE OF CONTENTS

### ARTICLES

Automata presenting structures: A survey of the finite string case, by SASHA RUBIN ...	169
Mathematical fuzzy logics, by SIEGFRIED GOTTFELD .....	210
Gentzen's proof of normalization for natural deduction, by JAN VON PLATO .....	240

### REVIEWS

T. Franzén, <i>Inexhaustibility: a non-exhaustive treatment and a survey on transfinite progressions</i> . Reviewed by Lev D. Beklemishev .....	258
R. Taschner, <i>The Continuum</i> . Reviewed by Robert Lubarsky .....	260
N. Salmon <i>Metaphysics, mathematics, and meaning</i> . Reviewed by Brian van den Broek .....	262
I. Chiswell and W. Hodges, <i>Mathematical logic</i> . Reviewed by Robert Lubarsky .....	265
J. H. Lambert, <i>Philosophische Schriften, Vol. VIII</i> . Reviewed by Volker Peckhaus ...	267
K. Došen and Z. Petrić, <i>Proof-net categories</i> . Reviewed by Lutz Straßburger .....	268
C. Martínez, J. L. Falguera and J. M. Sagüillo (editors), <i>Current topics in logic and analytic philosophy</i> . Reviewed by Alasdair Urquhart .....	271
C. Thiel (editor), <i>Leopold Löwenheim (1878–1957)</i> . Reviewed by Volker Peckhaus ..	272
Notices .....	274

THE BULLETIN OF SYMBOLIC LOGIC (ISSN 1079-8986) is published quarterly, in the months of March, June, September, and December, by the Association for Symbolic Logic, Inc., 124 Raymond Avenue, Poughkeepsie, NY 12604-0001, USA. Periodicals postage is paid at Poughkeepsie NY and at additional mailing offices. The BULLETIN is distributed with THE JOURNAL OF SYMBOLIC LOGIC; the 2008 annual subscription price for the two journals is US\$555. Online subscription is available from Project Euclid; visit <http://projecteuclid.org/bsl>. **Postmaster:** Send address changes to *The Bulletin of Symbolic Logic*, c/o *American Mathematical Society*, 201 Charles Street, Providence, RI 02904-2294, USA. Business correspondence should be sent to the Secretary-Treasurer of the Association, Charles Steinhorn (address on inside back cover).

The BULLETIN, the JOURNAL, and the REVIEW OF SYMBOLIC LOGIC are the official organs of the Association for Symbolic Logic, an international organization for furthering research in all aspects of symbolic logic. The BULLETIN encourages submission of *Articles* and *Communications* in all areas of logic, including mathematical or philosophical logic, logic in computer science or linguistics, the history or philosophy of logic, and applications of logic to other fields. The BULLETIN also publishes reviews of publications in logic.

*Articles* should be of broad interest and accessible to a wide audience of logicians. They may be purely expository, survey, or historical articles, or they may contain, in addition, new ideas or results or new approaches to old ones.

*Communications* should be announcements of important new results and ideas in any aspect of logic; they may be short papers in their final form or preliminary announcements (extended abstracts, position papers) of longer, full papers that will be published elsewhere. In any case, they should include, in addition to a description of the new results or ideas, enough history, background, and explanation to make the significance of the work apparent to a wide audience. *Communications* will be quickly refereed and published within six months of the submission of final versions.

*Continued on inside back cover*

10 9 8 7 6 5 4 3 2 1    13 12 11 10 09 08

THE  
BULLETIN  
OF  
SYMBOLIC LOGIC

EDITED BY

ROD DOWNEY, Managing Editor

JOHN BALDWIN    ILIJAS FARAH    VOLKER HALBACH

MARTIN OTTO    MICHAEL RATHJEN

ERICH RECK    KATRIN TENT

REVIEWS EDITORS

ALASDAIR URQUHART, Reviews Managing Editor (NUMBER 1–3)

STEVE AWODEY, Reviews Managing Editor (NUMBER 4)

JOHN BALDWIN    LEV BEKLEMISHEV    ANUJ DAWAR

MIRNA DŽAMONJA    DAVID EVANS    ERICH GRÄDEL

DENIS HIRSCHFELDT    HANNES LEITGEB    ROGER MADDUX

GRIGORI MINTS    VOLKER PECKHAUS    SŁAWOMIR SOLECKI

VOLUME 14

2008

PUBLISHED QUARTERLY BY THE ASSOCIATION FOR SYMBOLIC LOGIC, INC.  
WITH SUPPORT FROM INSTITUTIONAL AND CORPORATE MEMBERS

---

The four numbers of Volume 14 are copyrighted ©2008 by the Association for Symbolic Logic, Inc. Reproduction of copyrighted numbers of the BULLETIN by photostat, photoprint, microfilm, or like process is forbidden, except by written permission, to be obtained from the Secretary of the Association, Charles Steinhorn, ASL, Box 742, Vassar College, 124 Raymond Avenue, Poughkeepsie, NY 12604, USA.

The paper used in this BULLETIN is acid-free and falls within the guidelines established to ensure permanence and durability.

This BULLETIN has been registered with the Copyright Clearance Center, Inc. The appearance of a code at the bottom of the first page of an article indicates the copyright owner's consent for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law, provided that the per-copy fee stated in the code is paid directly to Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA. This consent does not extend to copying for general distribution, for advertising or promotion purposes, for creating new collective works, or for resale. Specific written permission for such copying must be obtained from the Association.

## CONTENTS OF VOLUME 14

### ARTICLES

AWODEY, STEVE. A brief introduction to algebraic set theory .....	281
BONNAY, DENIS. Logicality and invariance .....	29
DERSHOWITZ, NACHUM and GUREVICH, YURI. A natural axiomatization of computability and proof of Church's Thesis .....	299
GOTTWALD, SIEGFRIED. Mathematical fuzzy logics .....	210
GRUSZCZYŃSKI, RAFAŁ and PIETRUSZCZAK, ANDRZEJ. Full development of Tarski's geometry of solids .....	481
KANAMORI, AKIHIRO. Cohen and set theory .....	351
PESTOV, VLADIMIR G. Hyperlinear and sofic groups: a brief guide .....	449
VON PLATO, JAN. Gentzen's proof of normalization for natural deduction .....	240
PRATT-HARTMANN, IAN. On the computational complexity of the numerically definite syllogistic and related logics .....	1
RUBIN, SASHA. Automata presenting structures: A survey of the finite string case ..	169
SCOTT, DANA and MCCARTY, DOMINIC. Reconsidering ordered pairs .....	379

### COMMUNICATIONS

CHOLAK, PETER A., DOWNEY, RODNEY, and HARRINGTON, LEO A. The complexity of orbits of computably enumerable sets .....	69
JALIGOT, ERIC, MURANOV, ALEXEY, and NEMAN, AZADEH. Independence property and hyperbolic groups .....	88
VIALE, MATTEO. Forcing axioms, supercompact cardinals, singular cardinal combinatorics .....	99

### REVIEWS

G. Cherlin and E. Hrushovski, <i>Finite structures with few types</i> . Reviewed by Vera Koponen .....	114
G. Priest, <i>Towards non-being: the logic and metaphysics of intentionality</i> . Reviewed by Thomas Hofweber .....	116
M. Ardeshir, <i>Mantegh� Riazi</i> . Reviewed by Ali Enayat .....	118
T. Aho and A.-V. Pietarinen (editors), <i>Truth and games: Essays in honour of Gabriel Sandu</i> . Reviewed by Alasdair Urquhart .....	119
T. Franz�n, <i>Inexhaustibility: a non-exhaustive treatment and a survey on transfinite progressions</i> . Reviewed by Lev D. Beklemishev .....	258
R. Taschner, <i>The Continuum</i> . Reviewed by Robert Lubarsky .....	260
N. Salmon <i>Metaphysics, mathematics, and meaning</i> . Reviewed by Brian van den Broek .....	262
I. Chiswell and W. Hodges, <i>Mathematical logic</i> . Reviewed by Robert Lubarsky .....	265

J. H. Lambert, <i>Philosophische Schriften, Vol. VIII</i> . Reviewed by Volker Peckhaus..	267
K. Došen and Z. Petrić, <i>Proof-net categories</i> . Reviewed by Lutz Straßburger .....	268
C. Martinez, J. L. Falguera and J. M. Sagüillo (editors), <i>Current topics in logic and analytic philosophy</i> . Reviewed by Alasdair Urquhart .....	271
C. Thiel (editor), <i>Leopold Löwenheim (1878–1957)</i> . Reviewed by Volker Peckhaus.	272
A. Rayo and G. Uzquiano (editors), <i>Absolute generality</i> . Reviewed by Peter Smith	398
G. Brady, <i>From Peirce to Skolem</i> . Reviewed by John Corcoran .....	541
G. Priest, <i>An introduction to non-classical logic: From If to Is</i> . Reviewed by Petr Hájek .....	544

#### MEETINGS OF THE ASSOCIATION FOR SYMBOLIC LOGIC

2007 European Summer Meeting of the Association for Symbolic Logic, Logic Colloquium '07, Wrocław, Poland, July 14–July 19, 2007 .....	123
2007–2008 Winter Meeting of the Association for Symbolic Logic, San Diego Convention Center, San Diego, CA, January 8–9, 2008 .....	402
2008 Spring Meeting of the Association for Symbolic Logic, The Sheraton Hotel, Pasadena, California, March 20–21, 2008 .....	412
2008 Annual Meeting of the Association for Symbolic Logic, University of California, Irvine, California, March 27–30, 2008 .....	418

#### MEETINGS SPONSORED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

14th Workshop on Logic, Language, Information and Computation (WoLLIC 2007), Rio de Janeiro, Brazil, July 2–5, 2007 .....	160
The 2007 Annual Conference of the Australasian Association for Logic, Melbourne, Australia, November 9–11, 2007 .....	438
Second Indian Winter School on Logic, Indian Institute of Technology, Kanpur, January 14–26, 2008 .....	546
Conference on Computability, Complexity and Randomness. Nanjing University, China, May 19–23, 2008 .....	548
15TH Workshop on Logic, Language, Information and Computation (WoLLIC 2008), Edinburgh, Scotland, July 1–4, 2008 .....	550
Corrigendum to “Incompleteness in a general setting” .....	122
Errata to “Cohen and set theory” .....	552
Notices .....	162, 274, 444, 615
Officers and Committees of the Association for Symbolic Logic .....	553
Members of the Association .....	559