

THE
BULLETIN
OF
SYMBOLIC LOGIC

EDITED BY

ROD DOWNEY, Managing Editor

JOHN BALDWIN ILIJAS FARAH PHOKION KOLAITIS
PENELOPE MADDY MICHAEL RATHJEN KATRIN TENT

REVIEWS EDITORS

ALASDAIR URQUHART, Reviews Managing Editor

STEVE AWODEY JOHN BALDWIN LEV BEKLEMISHEV
MIRNA DŽAMONJA DAVID EVANS ERICH GRÄDEL
DENIS HIRSCHFELDT ROGER MADDUX GRIGORI MINTS
LUKE ONG VOLKER PECKHAUS SŁAWOMIR SOLECKI

VOLUME 13 · NUMBER 2 · JUNE 2007
ISSN 1079-8986

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

*Copyright ©2007 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

Gödel and set theory, by AKIHIRO KANAMORI	153
In the shadows of the Löwenheim–Skolem theorem: Early combinatorial analyses of mathematical proofs, by JAN VON PLATO	189

COMMUNICATIONS

Local definitions in degree structures: the Turing jump, hyperdegrees and beyond, by RICHARD A. SHORE	226
-------------------------------------------------------------------------------------------------------------	-----

REVIEWS

M. Burgin, <i>Super-recursive algorithms</i> . Reviewed by Martin Davis	240
T. Franzén, <i>Gödel's theorem: an incomplete guide to its use and abuse</i> . Reviewed by Lev D. Beklemishev	241
S. Galvan, <i>Einführung in die Unvollständigkeitstheoreme</i> . Reviewed by Andrea Reichenberger	243
A. Kock, <i>Synthetic differential geometry</i> . Reviewed by John L. Bell	244
M. Vorobej, <i>A Theory of Argument</i> . Reviewed by Douglas Walton	245
J. Flum and M. Grohe, <i>Parameterized complexity theory</i> . Reviewed by Thomas Schwentick	246
D. M. Gabbay and F. Guenther, editors, <i>Handbook of philosophical logic</i> , vol. 10. Reviewed by Theo M. V. Janssen	248
2006 Summer Meeting of the Association for Symbolic Logic, Logic Colloquium '06, Nijmegen, The Netherlands, July 27–August 2, 2006	251
Notices	299

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 2007 annual subscription price for the two journals is US\$540. Online subscription is available from Project Euclid; visit <http://projecteuclid.org/bs1>. **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 and the JOURNAL 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.

Continued on inside back cover

10 9 8 7 6 5 4 3 2 1 12 11 10 09 08 07

THE
BULLETIN
OF
SYMBOLIC LOGIC

EDITED BY

ROD DOWNEY, Managing Editor

JOHN BALDWIN ILIJAS FARAH PHOKION KOLAITIS
PENELOPE MADDY MICHAEL RATHJEN KATRIN TENT

REVIEWS EDITORS

ALASDAIR URQUHART, Reviews Managing Editor

STEVE AWODEY JOHN BALDWIN LEV BEKLEMISHEV
MIRNA DŽAMONJA DAVID EVANS ERICH GRÄDEL
DENIS HIRSCHFELDT ROGER MADDUX GRIGORI MINTS
LUKE ONG VOLKER PECKHAUS SŁAWOMIR SOLECKI

VOLUME 13
2007

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

The four numbers of Volume 13 are copyrighted ©2007 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 13

ARTICLES

AWODEY, S., BUTZ, C., SIMPSON, A., and STREICHER, T. Relating first-order set theories and elementary toposes	340
BELL, JOHN L. Incompleteness in a general setting	21
KANAMORI, AKIHIRO. Gödel and set theory	153
MATHERON, ÉTIENNE and ZELENÝ, MIROSLAV. Descriptive set theory of families of small sets	482
NEEMAN, ITAY. Inner models and ultrafilters in $L(\mathbb{R})$	31
NIES, ANDRÉ. Describing groups	305
VON PLATO, JAN. In the shadows of the Löwenheim–Skolem theorem: Early combinatorial analyses of mathematical proofs	189
SEGERLIND, NATHAN. The complexity of propositional proofs	417
WEAVER, NIK. Set theory and C^* -algebras	1

COMMUNICATIONS

MONTALBÁN, ANTONIO. On the equimorphism types of linear orderings	71
RÖSSLER, MICHAL and JEŘÁBEK, EMIL. Fragment of nonstandard analysis with a finitary consistency proof	54
SHORE, RICHARD A. Local definitions in degree structures: the Turing jump, hyperdegrees and beyond	226

REVIEWS

F. Widebäck, <i>Identity of proofs</i> . Reviewed by Sergei Soloviev	100
L. Corry, <i>Modern algebra and the rise of mathematical structures</i> . Reviewed by Thomas Drucker	102
P. C. Gilmore, <i>Logicism renewed: logical foundations for mathematics and computer science</i> . Reviewed by James H. Andrews	104
S. G. Simpson (editor), <i>Reverse Mathematics 2001</i> . Reviewed by Ulrich Berger	106
V. F. Hendricks, <i>Mainstream and formal epistemology</i> . Reviewed by Paul Égré	110
M. Burgin, <i>Super-recursive algorithms</i> . Reviewed by Martin Davis	240
T. Franzén, <i>Gödel's theorem: an incomplete guide to its use and abuse</i> . Reviewed by Lev D. Beklemishev	241
S. Galvan, <i>Einführung in die Unvollständigkeitstheoreme</i> . Reviewed by Andrea Reichenberger	243
A. Kock, <i>Synthetic differential geometry</i> . Reviewed by John L. Bell	244
M. Vorobej, <i>A theory of argument</i> . Reviewed by Douglas Walton	245
J. Flum and M. Grohe, <i>Parameterized complexity theory</i> . Reviewed by Thomas Schwentick	246

D. M. Gabbay and F. Guenther, editors, <i>Handbook of philosophical logic</i> , vol. 10. Reviewed by Theo M. V. Janssen	248
L. Wos and G. W. Pieper, <i>A fascinating country in the world of computing—your guide to automated reasoning</i> . Reviewed by Robert K. Meyer	359
J. L. Bell, <i>The continuous and the infinitesimal in mathematics and philosophy</i> . Reviewed by Philip Ehrlich	361
P. Hinman, <i>Fundamentals of mathematical logic</i> . Reviewed by Eric J. Hall	363
R. Tieszen, <i>Phenomenology, logic, and the philosophy of mathematics</i> . Reviewed by Kai Hauser	365
J. Ferreirós and J. J. Gray (editors), <i>The architecture of modern mathematics</i> . Reviewed by Torsten Wilholt	368
H. J. Gensler, <i>Historical dictionary of logic</i> . Reviewed by Roman Murawski	370
S. Awodey, <i>Category theory</i> . Reviewed by Jiří Rosický	371
N. J. Cutland, M. Di Nasso and D. A. Ross (editors), <i>Nonstandard methods and applications in mathematics</i> . Reviewed by Alasdair Urquhart	372
S. Hedman, <i>A first course in logic: an introduction to model theory, proof theory, computability, and complexity</i> . Reviewed by Alasdair Urquhart	538
R. Epstein, <i>Classical mathematical logic</i> . Reviewed by H. B. Enderton	540
G. Priest, <i>Doubt truth to be a liar</i> . Reviewed by Kevin Scharp	541
R. Brady, <i>Universal logic</i> . Reviewed by Greg Restall	544
K. Sigmund, J. Dawson, and K. Mühlberger, <i>Kurt Gödel: Das Album. The Album</i> . Reviewed by Volker Peckhaus	547
J. Barnes, <i>Truth, etc.</i> . Reviewed by Mirja Hartimo	549

IN MEMORIAM

In memoriam: Saunders Mac Lane, 1909–2005. By STEVE AWODEY	115
------------------------------------------------------------	-----

MEETINGS OF THE ASSOCIATION FOR SYMBOLIC LOGIC

2006 Annual Meeting of the Association for Symbolic Logic, Université du Québec à Montréal, Montréal, Québec, Canada, May 17–21, 2006	120
2006 Summer Meeting of the Association for Symbolic Logic, Logic Colloquium '06, Nijmegen, The Netherlands, July 27–August 2, 2006	251
2006–07 Winter Meeting of the Association for Symbolic Logic, New Orleans Marriott and Sheraton New Orleans, New Orleans, Louisiana, January 7–8, 2007	375
2007 Annual Meeting of the Association for Symbolic Logic, University of Florida, Gainesville, Florida, March 10–13, 2007	386
2006 Annual Meeting of the Association for Symbolic Logic, Université du Québec à Montréal, Montréal, Québec, Canada, May 17–21, 2006 — Addendum	409
2007 Spring Meeting of the Association for Symbolic Logic, The Palmer House Hilton Hotel, Chicago, Illinois, April 19–21, 2007	553

MEETINGS SPONSORED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

13TH Workshop on Logic, Language, Information and Computation (WoLLIC '06), CSLI, Stanford, USA, July 18–21, 2006	410
Notices	146, 299, 412, 622
Officers and Committees of the Association for Symbolic Logic	561
Members of the Association	566