THE

BULLETIN

OF

SYMBOLIC LOGIC

EDITED BY

ROD DOWNEY, Managing Editor

ILUAS FARAH AKIHIRO KANAMORI PHOKION KOLAITIS

MANUEL LERMAN PENELOPE MADDY 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 - Luke Ong
Grigori Mints Volker Peckhaus Sławomir Solecki

VOLUME 12 · NUMBER 3 · SEPTEMBER 2006 ISSN 1079-8986

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

Copyright ©2006 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

Degree structures: local and global investigations, by RICHARD A. SHORE	369
Randomness and computability: open questions, by Joseph S. Miller and André	
Nies	390
Calibrating randomness, by R. Downey, D. R. Hirschfeldt, A. Nies, and S. A.	
TERWIJN	411
Reviews	
M. Hallett and U. Majer (editors), David Hilbert's lectures on the foundations of	
geometry 1891–1902. Reviewed by Jan von Plato	492
M. Dietzfelbinger, Primality testing in polynomial time. Reviewed by Charles Rackoff	494
D. Macbeth, Frege's logic. Reviewed by Norma B. Goethe	496
A. Bundy, D. Basin, D. Hutter and A. Ireland, Rippling: meta-level guidance for	
mathematical reasoning. Reviewed by Joe Hurd	498
D. Makinson, Bridges from classical to nonmonotonic logic. Reviewed by Hykel	
Hosni	499
2005–06 Winter Meeting of the Association for Symbolic Logic, The Hilton New	
York Hotel, New York, NY, December 27–29, 2005	503
2005 Annual Conference of the Australasian Association for Logic, Perth, Australia,	303
September 24–25, 2005	517
Notices	524
1100000 1111111111111111111111111111111	241

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 2006 annual subscription price for the two journals is US\$\$15. 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, R102904-2294, 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.

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

THE

BULLETIN

OF

SYMBOLIC LOGIC

EDITED BY

ROD DOWNEY, Managing Editor

ILIJAS FARAH AKIHIRO KANAMORI PHOKION KOLAITIS MANUEL LERMAN PENELOPE MADDY 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 Luke Ong
Grigori Mints Volker Peckhaus Sławomir Solecki

VOLUME 12 2006

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

The four numbers of Volume 12 are copyrighted ©2006 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 12

ARTICLES

BALCAR, BOHUSLAV and JECH, THOMAS. Weak distributivity, a problem of von Neumann and the mystery of measurability	241
Calvert, Wesley and Knight, Julia F. Classification from a computable viewpoint	191
Corcoran, John. Schemata: the concept of schema in the history of logic	219
DE Mol, Liesbeth. Closing the circle: an analysis of Emil Post's early work	267
Downey, Rod, Hirschfeldt, Denis R., Nies, André, and Terwijn, Sebastiaan A. Calibrating randomness	411
Hauser, Kai. Gödel's Program revisited, Part I: the turn to phenomenology	529
Janés, Ignacio. What is Tarski's <i>common</i> concept of consequence?	<i>32)</i>
Keisler, H. Jerome. Nonstandard arithmetic and reverse mathematics	100
LINSKY, BERNARD and ZALTA, EDWARD N. What is neologicism? MILLER, JOSEPH S. and NIES, ANDRÉ. Randomness and computability: open ques-	60
tions	390 43
SHORE, RICHARD A. Degree structures: local and global investigations	369
WEIERMANN, Andreas. Classifying the provably total functions of PA	177
Communications	
FRIEDMAN, SY-DAVID. Internal consistency and the inner model hypothesis	591
Reviews	
I. Farah, Analytic quotients. Reviewed by D. H. Fremlin	126
K. R. Apt, <i>Principles of constraint programming</i> . Reviewed by Hubie Chen	128
New philosophical essays. Reviewed by Francis Jeffry Pelletier	131
HC. Schmidt am Busch and K. F. Wehmeier (editors), Heinrich Scholz. Logiker,	
Philosoph, Theologe. Reviewed by Matthias Wille	135
Moktefi	137
V. Peckhaus (editor), Oskar Becker und die Philosophie der Mathematik. Reviewed by Risto Vilkko	137
M. van Lambalgen and F. Hamm, <i>The proper treatment of events</i> . Reviewed by	137
Marcus Kracht	139
R. Wolf, A tour through mathematical logic. Reviewed by Michael Stob	141
J. Nolt, Logics. Reviewed by Richard L. Epstein	290
B. Hale and C. Wright, <i>The reason's proper study: Essays toward a neo-Fregean philosophy of mathematics</i> . Reviewed by Gabriel Uzquiano	291

G. Priest, An introduction to non-classical logic. Reviewed by Petr Hájek	294
	296
T. Ehrhard, JY. Girard, P. Ruet, and P. Scott, Linear logic in computer science.	270
	297
	299
D. J. Pym and E. Ritter Reductive logic and proof-search—Proof theory, semantics,	233
· · · · · · · · · · · · · · · · · · ·	302
M. Mitzenmacher and E. Upfal, <i>Probability and computing: Randomized algorithms</i>	302
	304
E. Schechter, Classical and nonclassical logic: an introduction to the mathematics of	507
propositions. Reviewed by Roger D. Maddux	308
M. Hallett and U. Majer (editors), David Hilbert's lectures on the foundations of	
	492
•	494
	496
A. Bundy, D. Basin, D. Hutter and A. Ireland, Rippling: meta-level guidance for	470
	498
D. Makinson, Bridges from classical to nonmonotonic logic. Reviewed by Hykel	770
	499
M. Tiles, The philosophy of set theory, an historical introduction to Cantor's paradise.	1,,,
	601
•	605
W. Tait, The provenance of pure reason: essays in the philosophy of mathematics and	
	608
L. Crosilla and P. Schuster (editors), From sets and types to topology and analysis—	
towards practicable foundations for constructive mathematics. Reviewed by Jaap van	
	611
MEETINGS OF THE ASSOCIATION FOR SYMBOLIC LOGIC	
2005 Annual Meeting of the Association for Symbolic Logic, Stanford University,	
Stanford, CA, March 19–22, 2005	143
2005 Summer Meeting of the Association for Symbolic Logic, Logic Colloquium '05,	
	310
2005-06 Winter Meeting of the Association for Symbolic Logic, The Hilton New	
	503
2005–06 Winter Meeting of the Association for Symbolic Logic, San Antonio Con-	
vention Center, San Antonio, Texas, January 14–15, 2006	613
MEETINGS SPONSORED BY THE ASSOCIATION FOR SYMBOLIC LOGIC	
2005 Annual Conference of the Australasian Association for Logic, Perth, Australia,	
-	517
Notices	687
	682
•	625