

# THE REVIEW OF SYMBOLIC LOGIC

## **Edited by**

Andrew Arana, *Coordinating Editor*

Walter Dean

Fernando Ferreira

Wesley Holliday

Peter Koellner

David Ripley

Robert van Rooij

Jamie Tappenden

Sara Uckelman

Charlotte Werndl

**VOLUME 10 • NUMBER 1 • MARCH 2017 • ISSN 1755-0203**

Copyright © 2017 by the Association for Symbolic Logic. All rights reserved.  
Reproduction by photostat, photo-print, microfilm, or like process by permission only.

# THE REVIEW OF SYMBOLIC LOGIC

## Coordinating Editor

Andrew Arana

*Department of Philosophy, University of Paris 1 Panthéon-Sorbonne*

## Editors

Walter Dean

*Department of Philosophy  
University of Warwick*

Fernando Ferreira

*Department of Mathematics  
University of Lisbon*

Wesley Holliday

*Department of Philosophy  
University of California, Berkeley*

Peter Koellner

*Department of Philosophy  
Harvard University*

David Ripley

*Department of Philosophy  
University of Connecticut*

Robert van Rooij

*Department of Philosophy and  
Institute for Logic  
University of Amsterdam*

Jamie Tappenden

*Department of Philosophy  
University of Michigan*

Sara Uckelman

*Department of Philosophy  
Durham University*

Charlotte Werndl

*Department of Philosophy  
University of Salzburg*

## Advisory Board

Maria Aloni

*Department of Philosophy and Institute  
for Logic, Language and Computation  
University of Amsterdam*

Roy Cook

*Department of Philosophy and Minnesota  
Center for Philosophy of Science  
University of Minnesota*

J. Michael Dunn

*Departments of Computer Science  
and Philosophy  
Indiana University*

Richard G. Heck

*Department of Philosophy  
Brown University*

Geoffrey Hellman

*Department of Philosophy  
University of Minnesota*

Juliette Kennedy

*Department of Mathematics  
and Statistics  
University of Helsinki*

Elaine Landry

*Department of Philosophy  
University of California, Davis*

Bernard Linsky

*Department of Philosophy  
University of Alberta*

Penelope Maddy

*Department of Logic and Philosophy  
of Science  
University of California, Irvine*

Edwin Mares

*School of History, Philosophy, Political  
Science & International Relations  
Victoria University of Wellington*

Rohit Parikh

*Department of Computer  
and Information Science Brooklyn College,  
City University of New York*

Greg Restall

*Department of Philosophy  
University of Melbourne*

Stewart Shapiro

*Department of Philosophy  
Ohio State University*

Gila Sher

*Department of Philosophy  
University of California, San Diego*

Achille C. Varzi

*Department of Philosophy  
Columbia University*

Rineke Verbrugge

*Institute of Artificial Intelligence  
University of Groningen*

# TABLE OF CONTENTS

|  |     |
|--|-----|
| Logic in the <i>Tractatus</i><br>MAX WEISS .....   | 1   |
| Logics Above $S_4$ and The Lebesgue Measure Algebra<br>TAMAR LANDO .....   | 51  |
| Uniform Definability in Propositional Dependence Logic<br>FAN YANG .....   | 65  |
| Generalizing Boolos' Theorem<br>GRAHAM LEACH-KROUSE .....  | 80  |
| Proving Unprovability<br>BRUNO WHITTLE .....   | 92  |
| Instantial Neighbourhood Logic<br>JOHAN VAN BENTHEM, NICK BEZHANISHVILI,<br>SEBASTIAN ENQVIST, AND JUNHUA YU .....           | 116 |
| Representing Conjunctive Deductions by Disjunctive Deductions<br>KOSTA DOŠEN AND ZORAN PETRIĆ .....                          | 145 |
| 'Chasing' The Diagram—The use of Visualizations<br>In Algebraic Reasoning<br>SILVIA DE TOFFOLI .....                         | 158 |
| Models of $PT^-$ with Internal Induction for Total Formulae<br>CEZARY CIEŚLIŃSKI, MATEUSZ ŁEŁYK,<br>AND BARTOSZ WCISŁO ..... | 187 |

**Subscription Information:** *Review of Symbolic Logic* (ISSN 1755-0203) is published quarterly by Cambridge University Press for the Association for Symbolic Logic. Annual subscription rates for Volume 10 (2017): Institutional subscription rates, print and online: US \$1054.00 in the USA, Canada, and Mexico; UK £662.00 + VAT elsewhere. Institutional subscription rates, online only: US \$904.00 in the USA, Canada, and Mexico; UK £569.00 + VAT elsewhere. Institutional subscription rates, print only: US \$1025.00 in the USA, Canada, and Mexico; UK £639.00 + VAT elsewhere. Individual subscription rates, online only: US \$217.00 in the USA, Canada, and Mexico; UK £135.00 + VAT elsewhere. Individual subscription rates, print only: US \$244.00 in the USA, Canada, and Mexico; UK £135.00 + VAT elsewhere. Institutional subscription correspondence should be sent to: Cambridge University Press, One Liberty Plaza, New York, NY 10006, USA, for customers in the USA, Canada, or Mexico. Customers elsewhere should contact: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK.

**Association for Symbolic Logic.** Individual Members of the Association for Symbolic Logic receive a print subscription to *The Review of Symbolic Logic* as a benefit of membership. Requests for information, applications for membership, orders for back volumes, business correspondence, and notices and announcements for publication in the *The Bulletin of Symbolic Logic* should be sent to the Secretary-Treasurer of the Association: **Charles Steinhorn, ASL, Box 742, Vassar College, 124 Raymond Avenue, Poughkeepsie, NY 12604, USA.** The email address of the Association's business office is [asl@vassar.edu](mailto:asl@vassar.edu). The ASL website is located at <http://www.aslonline.org>. Links from that site provide further information on the *Review* and on submitting papers for publication.

**Coordinating Editor:** Andrew Arana, University Paris 1 Panthéon-Sorbonne, UFR 10 Philosophy, Institut d'histoire et de philosophie des sciences et des techniques (IHPST), 13 rue de Four, 75006 Paris, France. Email: [andrew.arana@univ-paris1.fr](mailto:andrew.arana@univ-paris1.fr).

**Copyright:** All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopy, or otherwise, without permission in writing from Cambridge University Press. Photocopying information for users in the U.S.A.: Copying for internal or personal use beyond that permitted by Sec. 107 or 108 of the U.S. Copyright Law is authorized for users duly registered with the Copyright Clearance Center (CCC) Transaction Reporting Service, provided that the appropriate remittance per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923, USA. Specific written permission must be obtained for all other copying. General enquiries from the USA, Mexico, and Canada should be addressed to the New York office of Cambridge University Press <http://www.cambridge.org/us/information/rights/contacts/newyork.htm>; general enquiries from elsewhere should be addressed to the Cambridge office <http://www.cambridge.org/uk/information/rights/contacts/cambridge.htm>; permission enquiries from Australia and New Zealand should be addressed to the Melbourne office [http://www.cambridge.org/aus/information/contacts\\_melbourne.htm](http://www.cambridge.org/aus/information/contacts_melbourne.htm); enquiries regarding Spanish-language translation rights (only) should be addressed to the Madrid office <http://www.cambridge.org/uk/information/rights/contacts/madrid.htm>

Copyright © Association for Symbolic Logic, 2017