



THE JOURNAL OF SYMBOLIC LOGIC

Edited by

Philip Welch, *Coordinating Editor*

Matthias Aschenbrenner

Veronica Becher

Michael Benedikt

Enrique Casanovas

Stephen Jackson

Bakhadyr Khoussainov

Jan Krajíček

Colin McLarty

Thomas Strahm

VOLUME 84 • NUMBER 2 • JUNE 2019 • ISSN 0022-4812

Copyright © 2019 by the Association for Symbolic Logic. All rights reserved.
Reproduction by photostat, photo-print, microfilm, or like process by permission only.



PUBLISHED BY CAMBRIDGE UNIVERSITY PRESS FOR
AND ON BEHALF OF THE ASSOCIATION FOR SYMBOLIC LOGIC.

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 logic and the exchange of ideas among mathematicians, computer scientists, linguists, and others interested in this field.

The JOURNAL invites submission of original scholarly work in mathematical logic and its applications.

Editors

Philip Welch (Coordinating Editor)

School of Mathematics, University of Bristol, Clifton, Bristol, BS8 1TW, UK

(P.Welch@bristol.ac.uk);

Matthias Aschenbrenner

Department of Mathematics, University of California, Los Angeles, Box 951555, Los Angeles, CA 90095-1555, USA

(matthias@math.ucla.edu);

Veronica Becher

Departamento de Computación, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Pabellón I, Ciudad Universitaria C1428EGA, Buenos Aires, Argentina

(vbecher@dc.uba.ar);

Michael Benedikt

Department of Computer Science, Oxford University, Wolfson Building, Parks Road, Oxford, OX1 3QD, UK

(michael.benedikt@cs.ox.ac.uk);

Enrique Casanovas

Department of Mathematics and Computer Science University of Barcelona Gran Via 585, 08007 Barcelona, Spain

(e.casanovas@ub.edu);

Stephen Jackson

Department of Mathematics, University of North Texas, General Academics Building 435, 1155 Union Circle #311430, Denton, TX 76203-5017, USA

(stephen.jackson@unt.edu);

Bakhadyr Khoussainov

Department of Computer Science, University of Auckland, Private Bag 92019, Auckland, New Zealand
(bmk@cs.auckland.ac.nz);

Jan Krajíček

Department of Algebra, Faculty of Mathematics and Physics, Sokolovská 83, Prague, CZ-186 75, The Czech Republic

(krajicek@karlin.mff.cuni.cz);

Colin McLarty

Department of Philosophy, Case Western Reserve University, Clark Hall, 11130 Bellflower Road, Cleveland, OH 44106-7719, USA

(colin.mclarty@case.edu);

Thomas Strahm

Institut für Informatik, Universität Bern, Neubrückstrasse 10, CH-3012 Bern, Switzerland

(strahm@iam.unibe.ch).

Manuscripts should be submitted using the ASL's online system at <http://asljournals.org> where instructions directed specifically at using the system can also be found.

Authors should keep a complete copy of their submission and all electronic files from which it was created. They should also consult the more general guidelines for the submission of manuscripts at <http://www.aslonline.org/journals-journal-guide.html>. These instructions include the Association's standards about previous publication and plagiarism as well as information about copyrights and electronic copies of published papers.

No print offprints will be supplied but authors will receive a link to a freely accessible electronic pdf of their published article. Print offprints may be purchased if required.

TABLE OF CONTENTS

A correct polynomial translation of S4 into intuitionistic logic RAJEEV GORÉ and JIMMY THOMSON	439
Existence of modeling limits for sequences of sparse structures JAROSLAV NEŠETŘIL and PATRICE OSSONA DE MENDEZ	452
A tail cone version of the Halpern–Läuchli theorem at a large cardinal JING ZHANG	473
Being low along a sequence and elsewhere WOLFGANG MERKLE and LIANG YU	497
A separation result for countable unions of Borel rectangles DOMINIQUE LECOMTE	517
Kripke completeness of strictly positive modal logics over meet-semilattices with operators STANISLAV KIKOT, AGI KURUCZ, YOSHIHITO TANAKA, FRANK WOLTER, and MICHAEL ZAKHARYASCHEV	533
Minimum models of second-order set theories KAMERYN J. WILLIAMS	589
Destructibility of the tree property at $\aleph_{\omega+1}$ YAIR HAYUT and MENACHEM MAGIDOR	621
A new dp-minimal expansion of the integers ERAN ALOUF and CHRISTIAN D'ELBÉE	632
A theory of pairs for non-valuational structures ELITZUR BAR-YEHUDA, ASSAF HASSON, and YA'ACOV PETERZIL	664
The Harrington–Shelah model with large continuum THOMAS GILTON and JOHN KRUEGER	684
Definably simple stable groups with finitary groups of automorphisms ULLA KARHUMÄKI	704
ITP, ISP, and SCH SHERWOOD HACHTMAN and DIMA SINAPOVA	713
On a metric generalization of the $t\bar{t}$ -degrees and effective dimension theory TAKAYUKI KIHARA	726
Independence in generic incidence structures GABRIEL CONANT and ALEX KRUCKMAN	750
G_δ sets in σ -ideals generated by compact sets MAYA SARAN	781
Algebraic new foundations PAUL K. GORBOW	798
Spaces of types in positive model theory LEVON HAYKAZYAN	833
Axiomatization of provable n -provability EVGENY KOLMAKOV and LEV BEKLEMISHEV	849
Markov's principle and subsystems of intuitionistic analysis JOAN RAND MOSCHOVAKIS	870