

THE BULLETIN OF SYMBOLIC LOGIC

Edited by

James Cummings, *Managing Editor*
Guram Bezhanishvili Salma Kuhlmann
Katalin Bimbó Øystein Linnebo
Peter Dybjer Arno Pauly
Ali Enayat

Reviews Editors

Graham Leach-Krouse, *Managing Editor for Reviews*
Albert Atserias Antonio Montalbán
Mark van Atten Valeria de Paiva
Clinton Conley Christian Retoré
Johanna Franklin Marion Scheepers
Dugald Macpherson Nam Trang

Thesis Abstracts Editor

Sandra Müller

VOLUME 30 • NUMBER 2 • JUNE 2024 • ISSN 1079-8986

Copyright © 2024 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 & ASSESSMENT FOR
AND ON BEHALF OF THE ASSOCIATION OF 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 BULLETIN encourages submissions 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. It also encourages the submissions of abstracts for doctoral level theses in logic. The BULLETIN also publishes reviews of publications in logic.

Editors

James Cummings (Managing Editor), Department of Mathematical Sciences, Carnegie Mellon University, Wean Hall 6113, Pittsburgh, PA 15213, USA

jcumming@andrew.cmu.edu

Guram Bezhanishvili, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM 88003, USA

guram@nmsu.edu

Katalin Bimbó, Department of Philosophy, University of Alberta, 2-40 Assiniboia Hall Edmonton, AB T6G 2E7, Canada

bimbo@ualberta.ca

Peter Dybjer, Department of Computer Science and Engineering, Chalmers University of Technology, SE 412 96 Göteborg, Sweden

peterd@chalmers.se

Ali Enayat, Department of Philosophy, Linguistics, and Theory of Science, University of Gothenburg, Box 200, SE 405 30, Gothenburg, Sweden

ali.enayat@gu.se

Salma Kuhlmann, Fachbereich Mathematik und Statistik, Universität Konstanz, Konstanz 78457, Germany

salma.kuhlmann@uni-konstanz.de

Øystein Linnebo, Department of Philosophy, IFIKK, 0315 Oslo, Norway

oystein.linnebo@ifikk.uio.no

Arno Pauly, School of Mathematics and Computer Science, Swansea University, Bay Campus, Swansea SA1 8EN, UK

arno.m.pauly@gmail.com

Reviews editors

Graham Leach-Krouse (Managing Editor), Kansas State University, Kansas, USA, gleachkr@ksu.edu

Albert Atserias atserias@cs.upc.edu,

Mark van Atten mark.vanatten@univ-paris1.fr,

Clinton Conley clintonc@andrew.cmu.edu,

Johanna Franklin johanna.n.franklin@hofstra.edu,

Dugald Macpherson pmthdm@maths.leeds.ac.uk,

Antonio Montalbán antonio@math.berkeley.edu,

Valeria de Paiva valeria.depaiva@gmail.com,

Christian Retoré christian.retore@lirmm.fr,

Marion Scheepers mscheepe@boisestate.edu, and

Nam Trang namtrang35@gmail.com.

Thesis abstracts editor

Sandra Müller sandra.mueller@tuwien.ac.at

Articles present topics of broad interest in a way that is accessible to a large audience. They can 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 version.

To submit *Articles* or *Communications* please follow the procedure described at <https://aslonline.org/journals/the-bulletin-of-symbolic-logic/the-bulletin-of-symbolic-logic-submission-guidelines>.

To submit *Thesis Abstracts* please follow the procedure described at <https://aslonline.org/journals/the-bulletin-of-symbolic-logic/logic-thesis-abstracts-in-the-bulletin-of-symbolic-logic>.

Books for review in the BULLETIN should be sent to **ASL, Department of Mathematics, University of Connecticut, 341 Mansfield Road, U-1009, Storrs, CT 06269-1009, USA.**

TABLE OF CONTENTS

ARTICLES

The universal theory of the hyperfinite II_1 factor is not computable by ISAAC GOLDBRING AND BRADD HART	181
Iterated priority arguments in descriptive set theory by ADAM DAY, NOAM GREENBERG, MATTHEW HARRISON-TRAINOR AND DAN TURETSKY	199
Categorical quantification by CONSTANTIN C. BRÎNCUȘ	227
One-variable fragments of first-order logics by PETR CINTULA, GEORGE METCALFE AND NAOMI TOKUDA	253

REVIEWS

Compactness of ω_1 and strong axioms of determinacy Reviewed by Takehiko Gappo	279
Christopher Pincock. <i>Mathematics and Explanation</i> . Elements in the Philosophy of Mathematics. Cambridge University Press, Cambridge, UK, 2023, 80 pp. Reviewed by Daniele Molinini	282

THESIS ABSTRACTS

Martina Iannella, <i>From real-life to very strong axioms. Classification problems in Descriptive Set Theory and regularity properties in Generalized Descriptive Set Theory</i> . Università degli studi di Udine, Udine, Italy. 2023. Supervised by Alberto Marcone and co-supervised by Vincenzo Dimonte	285
Vittorio Cipriani, <i>Many problems, different frameworks: classification of problems in computable analysis and algorithmic learning theory</i> . Università degli studi di Udine, Udine, Italy, 2023. Supervised by Alberto Marcone and co-supervised by Luca San Mauro	287
Nicholas Pischke. <i>Proof-Theoretical Aspects of Nonlinear and Set-Valued Analysis</i> . Technische Universität Darmstadt, Darmstadt, Germany. 2024. Supervised by Prof. Dr. Ulrich Kohlenbach	288

MEETING REPORTS

Proof Society Autumn School and Workshop 2022, Co-Sponsored by the Association for Symbolic Logic, Utrecht, The Netherlands, November 7–12, 2022	290
Workshop: Finite Model Theory and Many-Valued Logic: Challenges and Interactions, Co-Sponsored by the Association for Symbolic Logic, Brisbane, Australia (online), November 10–12, 2022	292

Model Theory Conference in Celebration of Ludomir Newelski's 60th, Birthday, Co-Sponsored by the Association for Symbolic Logic, Bedlewo, Poland, December 17–21, 2022	293
NOTICES	294