

CONTEMPORARY MATHEMATICS

302

Logic and Algebra

Edited by Yi Zhang

with a Preface by Oleg Belegradek



American Mathematical Society
Providence, Rhode Island

Editorial Board

Dennis DeTurck, managing editor

Andreas Blass Andy R. Magid Michael Vogelius

This volume was inspired by a series of lectures in logic and algebra given at three conferences and weekly seminars at Istanbul Bilgi University during the 1999–2000 and 2000–2001 academic years.

2000 *Mathematics Subject Classification*. Primary 03E17, 03E35, 03E50, 03C35, 03C45, 03C60, 03C98, 03C62, 20E32, 20B30.

Library of Congress Cataloging-in-Publication Data

Logic and algebra / Yi Zhang, editor.

p. cm. — (Contemporary mathematics, ISSN 0271-4132 ; v. 302)

ISBN 0-8218-2984-X (alk. paper)

1. Model theory. 2. Algebra. 3. Set theory. I. Zhang, Yi, 1964. II. Contemporary mathematics (American Mathematical Society) ; v. 302.

QA9.7.L64 2002
511.3—dc21

2002027665

Copying and reprinting. Material in this book may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, Rhode Island 02904-2294, USA. Requests can also be made by e-mail to reprint-permission@ams.org.

Excluded from these provisions is material in articles for which the author holds copyright. In such cases, requests for permission to use or reprint should be addressed directly to the author(s). (Copyright ownership is indicated in the notice in the lower right-hand corner of the first page of each article.)

© 2002 by the American Mathematical Society. All rights reserved.

The American Mathematical Society retains all rights
except those granted to the United States Government.

Printed in the United States of America.

∞ The paper used in this book is acid-free and falls within the guidelines
established to ensure permanence and durability.

Visit the AMS home page at <http://www.ams.org/>

10 9 8 7 6 5 4 3 2 1 07 06 05 04 03 02

Contents

Mad families and iteration theory JÖRG BRENDLE	1
Nearly adequate sets ANDREAS BLASS	33
How tall is the automorphism tower of a group? JOEL DAVID HAMKINS	49
Reflection principles for the continuum JONATHAN STAVI AND JOUKO VÄÄNÄNEN	59
A theory of a generic function with derivations BORIS ZILBER	85
Poly-regular ordered Abelian groups OLEG BELEGRADEK	101
On the logical strength of the automorphism groups of free nilpotent groups VLADIMIR TOLSTYKH	113
Classification of the simple groups of finite Morley rank TUNA ALTINEL	121
Homogeneous model theory: existence and categoricity OLIVIER LESSMANN	149
Classification theory for abstract elementary classes RAMI GROSSBERG	165
Forking and multiplicity in first order theories JOHN T. BALDWIN	205
Groups acting on geometries TAPANI HYTTINEN	221
Relative categoricity in linear orderings WILFRID HODGES	235
Nonstandard analysis and an application to the symmetric group on natural numbers MAURO DI NASSO AND YI ZHANG	249

On the ordering of the nonstandard real line MAURO DI NASSO AND MARCO FORTI	259
Order-types of models of Peano arithmetic ANDREY BOVYKIN AND RICHARD KAYE	275