

FOREWORD

This special volume of *Theory and Applications of Categories* honours our colleague and friend, Professor Aurelio Carboni, who for many years has been a passionate and exuberant proponent of Category Theory.

Aurelio studied in Milan, where he got his Doctorate in Mathematics in 1970. His interest in category theory began in the early nineteen-seventies when he was one of the faithful attendees of F.W. Lawvere’s Perugia lectures on topos theory. Subsequently, Aurelio himself played an important role in making Italy a major centre for the subject.

In his academic career, Aurelio has been a professor at the Universities of Cosenza, Milan, Genoa and Como. He co-organized the international Category Theory meetings at Como in 1990 and 2000 and has been an invited research professor at several important Category Theory sites. He has served as an editor for the *Journal of Pure and Applied Algebra* and is currently an editor for *Theory and Applications of Categories* and for *Homology, Homotopy and Applications*.

Aurelio’s mathematical style is distinctive in a way that reflects his entire personality. We cannot do justice to either in a few lines. Rather, we encourage the reader to sample his divers contributions whose titles we have appended below. We especially encourage readers interested in the calculus of relations in a general category to follow Aurelio’s skilful use of it in characterizing various 2-categories of categories and in constructing free completions. His bicategorical approach provides a template for many future investigations by himself and others.

We thank the editors of *Theory and Applications of Categories*, and especially the Managing Editor Bob Rosebrugh and Associate Managing Editor Michael Barr, for the opportunity to prepare this volume.

The Guest Editors:

G. Janelidze, S. Lack, F.W. Lawvere, E.M. Vitale, and R.J. Wood

PUBLICATIONS OF PROFESSOR AURELIO CARBONI

1. (with G.C. Meloni) Costruzione algebrica dello spazio étalé, *Boll. Un. Mat. Ital.* (4) 12 (1975), no. 1-2, 192–197.

Published on 2004-12-05.

© The Editors of *Theory and Applications of Categories*, 2004. Permission to copy for private use granted.

2. Categorie di relazioni, *Istit. Lombardo Accad. Sci. Lett. Rend. A* 110 (1976), no. 2, 342–350 (1977).
3. (with M. Galuzzi) Anelli regolari e topoi, *Atti Accad. Sci. Torino Cl. Sci. Fis. Mat. Natur.* 111 (1977), no. 3–4, 227–231.
4. (with R. Betti) Cauchy-completion and the associated sheaf, *Cahiers Topologie Géom. Différentielle* 23 (1982), no. 3, 243–256.
5. (with R. Celia Magno) The free exact category on a left exact one *J. Austral. Math. Soc. Ser. A* 33 (1982), no. 3, 295–301.
6. Analisi non-standard e topos, *Rend. Istit. Mat. Univ. Trieste* 14 (1982), no. 1-2, 1–16.
7. (with R. Betti, R. Street, and R.F.C. Walters) Variation through enrichment, *J. Pure Appl. Algebra* 29 (1983), no. 2, 109–127.
8. (with R. Betti) A notion of topology for bicategories, *Cahiers Topologie Géom. Différentielle* 24 (1983), no. 1, 19–22.
9. Categorie di frecce parziali, *Riv. Mat. Univ. Parma* (4) 9 (1983), 281–288.
10. (with S. Kasangian and R. Street) Bicategories of spans and relations, *J. Pure Appl. Algebra* 33 (1984), no. 3, 259–267.
11. (with R. Street) Order ideals in categories, *Pacific J. Math.* 124 (1986), no. 2, 275–288.
12. (with S. Kasangian and R.F.C. Walters) An axiomatics for bicategories of modules, *J. Pure Appl. Algebra* 45 (1987), no. 2, 127–141.
13. Bicategories of partial maps, *Cahiers Topologie Géom. Différentielle Catég.* 28 (1987), no. 2, 111–126.
14. (with R.F.C. Walters) Cartesian bicategories I, *J. Pure Appl. Algebra* 49 (1987), no. 1-2, 11–32.
15. (with P.J. Freyd and A. Scedrov) A categorical approach to realizability and polymorphic types, in *Mathematical foundations of programming language semantics* (New Orleans, LA, 1987), 23–42, *Lecture Notes in Comput. Sci.*, 298, Springer, Berlin, 1988.
16. Categories of affine spaces, *J. Pure Appl. Algebra* 61 (1989), no. 3, 243–250.
17. Matrices, relations, and group representations, *J. Algebra* 136 (1991), no. 2, 497–529.

18. (with J. Lambek and M.C. Pedicchio) Diagram chasing in Mal'cev categories, *J. Pure Appl. Algebra* 69 (1991), no. 3, 271–284.
19. (with G.M. Kelly and R.J. Wood) A 2-categorical approach to change of base and geometric morphisms I, in International Category Theory Meeting (Bangor, 1989 and Cambridge, 1990), *Cahiers Topologie Géom. Différentielle Catég.* 32 (1991), no. 1, 47–95.
20. (with R. Rosebrugh) Lax monads Indexed monoidal monads, *J. Pure Appl. Algebra* 76 (1991), no. 1, 13–32.
21. (with M.C. Pedicchio and N. Pirovano) Internal graphs and internal groupoids in Mal'cev categories, *Category theory 1991 (Montreal, PQ, 1991)*, 97–109, *CMS Conf. Proc.*, 13, Amer. Math. Soc., Providence, RI, 1992.
22. (with S. Lack and R.F.C. Walters) Introduction to extensive and distributive categories, *J. Pure Appl. Algebra* 84 (1993), no. 2, 145–158.
23. (with S. Mantovani) An elementary characterization of categories of separated objects, *J. Pure Appl. Algebra* 89 (1993), no. 1-2, 63–92.
24. (with G.M. Kelly and M.C. Pedicchio) Some remarks on Maltsev and Goursat categories, *Appl. Categ. Structures* 1 (1993), no. 4, 385–421.
25. (with S. Johnson, R. Street, and D. Verity) Modulated bicategories, *J. Pure Appl. Algebra* 94 (1994), no. 3, 229–282.
26. (with G. Janelidze) Modularity and descent, *J. Pure Appl. Algebra* 99 (1995), no. 3, 255–265.
27. Some free constructions in realizability and proof theory, *J. Pure Appl. Algebra* 103 (1995), no. 2, 117–148.
28. (with M. Bunge) The symmetric topos, *J. Pure Appl. Algebra* 105 (1995), no. 3, 233–249.
29. (with P.T. Johnstone) Connected limits, familial representability and Artin glueing, in Fifth Biennial Meeting on Category Theory and Computer Science (Amsterdam, 1993), *Math. Structures Comput. Sci.* 5 (1995), no. 4, 441–459.
30. (with G. Janelidze) Decidable (= separable) objects and morphisms in lextensive categories, *J. Pure Appl. Algebra* 110 (1996), no. 3, 219–240.
31. (with M. Grandis) Categories of projective spaces, *J. Pure Appl. Algebra* 110 (1996), no. 3, 241–258.

32. (with G. Janelidze and A.R. Magid) A note on the Galois correspondence for commutative rings, *J. Algebra* 183 (1996), no. 1, 266–272.
33. (with G. Janelidze, G.M. Kelly, and R. Paré) On localization and stabilization for factorization systems, *Appl. Categ. Structures* 5 (1997), no. 1, 1–58.
34. (with E.M. Vitale) Regular and exact completions, *J. Pure Appl. Algebra* 125 (1998), no. 1-3, 79–116.
35. (with G.M. Kelly, D. Verity, and R.J. Wood) A 2-categorical approach to change of base and geometric morphisms II, *Theory Appl. Categ.* 4 (1998), No. 5, 82–136.
36. (with L. Birkedal, G. Rosolini, and D.S. Scott) Type theory via exact categories (extended abstract), *Thirteenth Annual IEEE Symposium on Logic in Computer Science (Indianapolis, IN, 1998)*, 188–198, IEEE Computer Soc., Los Alamitos, CA, 1998.
37. (with M.C. Pedicchio) A new proof of the Mal’cev theorem, in *Categorical studies in Italy (Perugia, 1997)* *Rend. Circ. Mat. Palermo (2) Suppl.* No. 64 (2000), 13–16.
38. (with G. Rosolini) Locally Cartesian closed exact completions, in *Category theory and its applications (Montreal, QC, 1997)*, *J. Pure Appl. Algebra* 154 (2000), no. 1-3, 103–116.
39. (with M.C. Pedicchio and J. Rosický) Syntactic characterizations of various classes of locally presentable categories, *J. Pure Appl. Algebra* 161 (2001), no. 1-2, 65–90.
40. (with G. Janelidze and R. Street) Foreword [on the 70th birthday of Gregory Maxwell Kelly], in *Special volume celebrating the 70th birthday of Professor Max Kelly*, *J. Pure Appl. Algebra* 175 (2002), no. 1-3, 1–5.
41. (with G. Janelidze) Boolean Galois theories, Dedicated to Professor Hvedri Inasaridze on the occasion of his 70th birthday, *Georgian Math. J.* 9 (2002), no. 4, 645–658.
42. (with G. Janelidze) Smash product of pointed objects in lextensive categories, *J. Pure Appl. Algebra* 183 (2003), no. 1-3, 27–43.
43. (with P.T. Johnstone) Corrigenda for: “Connected limits, familial representability and Artin glueing” [*Math. Structures Comput. Sci.* 5 (1995), no. 4, 441–459], *Math. Structures Comput. Sci.* 14 (2004), no. 1, 185–187.

This article may be accessed via WWW at <http://www.tac.mta.ca/tac/> or by anonymous ftp at <ftp://ftp.tac.mta.ca/pub/tac/html/volumes/13/13-fwd.{dvi,ps}>

THEORY AND APPLICATIONS OF CATEGORIES (ISSN 1201-561X) will disseminate articles that significantly advance the study of categorical algebra or methods, or that make significant new contributions to mathematical science using categorical methods. The scope of the journal includes: all areas of pure category theory, including higher dimensional categories; applications of category theory to algebra, geometry and topology and other areas of mathematics; applications of category theory to computer science, physics and other mathematical sciences; contributions to scientific knowledge that make use of categorical methods.

Articles appearing in the journal have been carefully and critically refereed under the responsibility of members of the Editorial Board. Only papers judged to be both significant and excellent are accepted for publication.

The method of distribution of the journal is via the Internet tools *WWW/ftp*. The journal is archived electronically and in printed paper format.

SUBSCRIPTION INFORMATION. Individual subscribers receive (by e-mail) abstracts of articles as they are published. Full text of published articles is available in .dvi, Postscript and PDF. Details will be e-mailed to new subscribers. To subscribe, send e-mail to tac@mta.ca including a full name and postal address. For institutional subscription, send enquiries to the Managing Editor, Robert Rosebrugh, rrosebrugh@mta.ca.

INFORMATION FOR AUTHORS. The typesetting language of the journal is $\text{T}_{\text{E}}\text{X}$, and $\text{\LaTeX}2\text{e}$ is the preferred flavour. $\text{T}_{\text{E}}\text{X}$ source of articles for publication should be submitted by e-mail directly to an appropriate Editor. They are listed below. Please obtain detailed information on submission format and style files from the journal's WWW server at <http://www.tac.mta.ca/tac/>. You may also write to tac@mta.ca to receive details by e-mail.

EDITORIAL BOARD.

Michael Barr, McGill University: barr@barrs.org, *Associate Managing Editor*

Lawrence Breen, Université Paris 13: breen@math.univ-paris13.fr

Ronald Brown, University of Wales Bangor: r.brown@bangor.ac.uk

Jean-Luc Brylinski, Pennsylvania State University: jlb@math.psu.edu

Aurelio Carboni, Università dell'Insubria: aurelio.carboni@uninsubria.it

Valeria de Paiva, Palo Alto Research Center: paiva@parc.xerox.com

Martin Hyland, University of Cambridge: M.Hyland@dpms.cam.ac.uk

P. T. Johnstone, University of Cambridge: ptj@dpms.cam.ac.uk

G. Max Kelly, University of Sydney: maxk@maths.usyd.edu.au

Anders Kock, University of Aarhus: kock@imf.au.dk

Stephen Lack, University of Western Sydney: s.lack@uws.edu.au

F. William Lawvere, State University of New York at Buffalo: wlawvere@buffalo.edu

Jean-Louis Loday, Université de Strasbourg: loday@math.u-strasbg.fr

Ieke Moerdijk, University of Utrecht: moerdijk@math.uu.nl

Susan Niefield, Union College: niefiels@union.edu

Robert Paré, Dalhousie University: pare@mathstat.dal.ca

Robert Rosebrugh, Mount Allison University: rrosebrugh@mta.ca, *Managing Editor*

Jiri Rosicky, Masaryk University: rosicky@math.muni.cz

James Stasheff, University of North Carolina: jds@math.unc.edu

Ross Street, Macquarie University: street@math.mq.edu.au

Walter Tholen, York University: tholen@mathstat.yorku.ca

Myles Tierney, Rutgers University: tierney@math.rutgers.edu

Robert F. C. Walters, University of Insubria: robert.walters@uninsubria.it

R. J. Wood, Dalhousie University: rjwood@mathstat.dal.ca