

Preface: Proceedings of the XVIII Brazilian Logic Conference

Jonas R. Becker Arenhart, Hugo L. Mariano, Wagner C. Sanz
and Daniel Ventura

As guest editors, it is our pleasure to announce this volume of the South American Journal of Logic (SAJL) containing articles with contributions from the *XVIII* Brazilian Logic Conference (EBL), which took place in the city of Pirenópolis, state of Goiás, Brazil, in May 9 – 12, 2017. The 2017 edition of the EBL continues a tradition of logic meetings sponsored by the Brazilian Society of Logic (SBL) that goes back to 1977, when the first EBL took place, while also bringing to light a plan of the society to bring the meeting to every corner of the country. In order to boost the development of logic in each region of Brazil, the meeting is planned to take place in every such regions.

As it is already usual in the EBL editions, the conference also had a Logic School aimed at students and every one interested in logic. Differently from previous editions, however, this time the School took place during the meeting itself, in May 9-11, in Pirenópolis, not before the meeting, as it used to be. The tutorials were:

- Jorge Viana (Escrevendo e raciocinando com diagramas – *Writing and reasoning with diagrams*, in Portuguese),
- Eduardo Fermé (Belief revision: 30 years),
- Jean-Yves Beziau (What is logic?),
- Evandro Gomes and Itala D’Ottaviano (A brief history of paraconsistency from Heraclitus to Newton da Costa),
- Abílio Rodrigues, Walter Carnielli, Marcelo Coniglio (An epistemic approach to paraconsistency),
- Rodolfo Ertola (Intuitionistic logic, an Introduction).

The Brazilian Logic Conference congregates the community of researchers in logic across Brazil and other countries, most notably the South-American logic

community. The 2017 edition gathered around 120 researchers (professors, students), most of them from Brazil and countries in South America. We hope the logic community, by its importance, keeps developing and creating bonds that boost the research in our continent, as it has been doing for a long time, with fruitful results. Keynote speakers from almost all regions of the world were invited: Joan Bagaria (Spain), Eduardo Barrio (Argentina), Torben Brauner (Denmark), Eduardo Fermé (Portugal), Fernando Ferreira (Portugal), Edward Haeusler (Brazil), Fairouz Kamareddine (Scotland), Cláudia Nálon (Brazil), Olivier Rioul (France), Moshe Vardi (USA).

Besides talks by keynote speakers and contributed talks, the conference also had 3 round tables and a special session for the 2017 Newton da Costa logic prize. This prize is part of a larger project of a logic prize in every country, and the Brazilian edition (the pioneer in this kind of prize) is being sponsored by the SBL since 2015. The winner of the 2017 logic prize was Cassiano Terra Rodrigues, with the paper “The method of scientific discovery in Peirce’s philosophy: deduction, induction, and abduction” published in *Logica Universalis*.

This is the first time that the SAJL is issued with proceedings of the EBL, and we wish to express our gratitude to the editors for opening this important space for it. We would also like to express our gratitude to the authors that contributed their papers to the volume. The reader will find here a sample of the diverse areas covered by the research in logic currently being developed in Brazil, with topics in mathematics, computation, and philosophy.

The 10 papers that are part of this SAJL volume are contributions dealing with aspects of Logic that are currently investigated in Brazil and South America. Despite the common fact that all the papers deal with symbolic logic in their development, we shall separate them in terms of emphasis/object of research. The classification of the papers results as follows: 1 paper in Philosophy, 3 papers in Computation Theory, and 6 papers in Mathematics. Here follows a brief presentation of these contributions, which are ordered in the journal in alphabetical order of family name of the first author.

Part of the papers that we classified as dealing with Mathematics are dedicated to the foundational issues: the papers “Finitary Filter Pairs and Propositional Logics” (P. Arndt, H. L. Mariano and D. C. Pinto) and “Analysing Categories of Signatures” (C. A. Mendes and H. L. Mariano) are focused on the analysis of original (filter pairs) and traditional (signature) themes related to propositional logics. The paper “More on Categorical Forms of the Axiom of Choice” (A. B. M. Brunner, H. L. Mariano, D. C. Pinto and S. G. da Silva), on its turn, as its title already indicates, deals with versions/generalizations of the axiom of choice.

The other part of the mathematical papers focuses on applications of Logic

to other areas of Mathematics: “Classifying Toposes for Some Theories of $C\omega$ -Rings” (J. C. Berni and H. L. Mariano) applies tools of categorial logic to the analysis of the algebraic structure of C-infinite rings that are relevant to differential geometry; these structures are featured also in the paper “Remarks on Expansion of the Real Field: Tameness, Hardy Fields and Smooth Rings” (R. Figueiredo and H. L. Mariano), which is in tune with current themes on model theory, such as O-minimal structures. The paper “On Rings of Fractions of Reduced f-Rings by Non-Zero Divisors” (F. Miraglia) also deals with applications of logic to ordered algebraic structures.

Now we briefly describe the three papers dealing with Logic in Computation Theory. The theoretical work “Dolev-Yao Multi-Agent Epistemic Logic” (M. R. F. Benevides, L. C. F. Fernandez and A. C. C. M. de Oliveira) has a practical motivation: authenticity and safety in communication protocols. The paper “On the Uncomputability of Partial Meet Contraction for Linear-Time Temporal Logic” (P. T. Guerra and R. Wassermann) deals with questions about classes of complexity and undecidability problems related with specific problems of the belief revision theory. The theoretical paper “Explicit Computational Paths” (A. F. Ramos, R. J. G. B. de Queiroz, A. G. de Oliveira and T. M. L. de Veras) makes a good use of the homotopy type theory, a rather recent technique of categorial logic.

“End of the Square?” (F. Schang) is the paper that closes this volume. This paper on philosophical logic revisits the Aristotelian square of oppositions presenting a new geometrization in order to deal with some objections raised to the square.

Finally, but not less important, the XVIII EBL was sponsored by CNPq, Capes, Fapego and Fapesp (Brazil), and promoted by the Federal University of Goiás (UFG), together with the University of Campinas (Unicamp) and the Brazilian Logic Society (SBL). We express our gratitude to them for the active support. We wish also to express our gratitude to the scholars who acted as reviewers to the papers in this volume; their efforts in providing for timely reviews were of utmost importance for this volume.

The editors

Jonas R. Becker Arenhart

Department of Philosophy

Federal University of Santa Catarina (UFSC)

Rua Eng. Agrônomo Andrei Cristian Ferreira, s/n - Trindade, CEP 88040-900, Florianópolis - SC, Brazil

E-mail: jonas.becker2@gmail.com

Hugo L. Mariano
Department of Mathematics
University of São Paulo (USP)
Rua do Matão 1010, CEP 05508-090, São Paulo, SP, Brazil
E-mail: hugomar@ime.usp.br

Wagner C. Sanz
Faculty of Philosophy
Federal University of Goiás (UFG)
Av Esperana, S/N, Campus Samambaia,
CEP 74690-900, Goiania, GO, Brazil
E-mail: wagnersanz@gmail.com

Daniel Ventura
Institute of Informatics
Federal University of Goiás (UFG)
Alameda Palmeiras, Quadra D, Campus Samambaia,
CEP 74690-900, Goiania, GO, Brazil
E-mail: daniel@inf.ufg.br