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THESIS ABSTRACTS

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Marco Abbadini, ***On the Axiomatisability of the Dual of Compact Ordered Spaces***, Università degli studi di Milano, Italy, 2021. Supervised by Vincenzo Marra. MSC: Primary 06F30, Secondary 06D50, 18C05. Keywords: Nachbin, duality, equational axiomatisation, variety of algebras, monadic, lattice-ordered monoids, Mundici, MV-monoidal algebras, Vietoris.

Abstract

We prove that the category of Nachbin's compact ordered spaces and order-preserving continuous maps between them is dually equivalent to a variety of algebras, with operations of at most countable arity. Furthermore, we observe that the countable bound on the arity is the best possible: the category of compact ordered spaces is not dually equivalent to any variety of finitary algebras. Indeed, the following stronger results hold: the category of compact ordered spaces is not dually equivalent to (i) any finitely accessible category, (ii) any first-order definable class of structures, and (iii) any class of finitary algebras closed under products and subalgebras. An explicit equational axiomatisation of the dual of the category of compact ordered spaces is obtained; in fact, we provide a finite one, meaning that our description uses only finitely many function symbols and finitely many equational axioms. In preparation for the latter result, we establish a generalisation of a celebrated theorem by Mundici: our result—whose proof is independent of Mundici's theorem—asserts that the category of unital commutative distributive lattice-ordered monoids is equivalent to the category of what we call MV-monoidal algebras.

Abstract taken directly from the thesis.

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URL: https://air.unimi.it/retrieve/handle/2434/812809/1698986/phd_unimi_R11882.pdf

Jeffrey Bergfalk, ***Dimensions of Ordinals: Set Theory, Homology Theory, and the First Omega Alephs***, Cornell University, Ithaca, NY, USA, 2018. Supervised by Justin Tatch Moore. MSC: 03E04, 55N05 (primary); 03E35, 18A25, 55N07, 03E75, 18G10, 18G20, 55N40. Keywords: ordinal, derived limit, Čech cohomology, minimal walks, strong homology, additivity.

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