

# **SEMINÁRIO DE LÓGICA MATEMÁTICA**

**Dia 25 de Fevereiro (segunda-feira), sala 6.2.33**

**16:00**

## **Non-deterministic semantics for non-classical logics: an approach from the perspective of model theory and universal algebra**

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### **Abstract:**

In this presentation, we will analyze some topics in the formal study of non-deterministic semantics for non-algebraizable logical systems using tools from universal algebra, model and category theory. Specifically, we want to address some open problems proposed in recent work on non-deterministic semantics and algebraization of non-deterministic model of logical systems through swap and Fidel structures. One of the greatest difficulties in the study of non-classical logic, including paraconsistent ones, is that these systems often can not be characterized by verofunctional semantics. In particular, systems of major philosophical interest are generally not algebraizable by the usual methods, such as those of Blok and Pigozzi. Currently, one of the most studied classes of paraconsistent logics is the one of Logics of Formal Inconsistency (LFI), introduced by Carnielli and Marcos in the year 2000 [1]. In [2], Coniglio, Figallo-Orellano and Golzio carried out a study, from the perspective of universal algebra and category theory, of classes of swap structures for several LFI's, beginning with mbC. It was obtained, among other important results, a representation theorem of Birkhoff type for each class of swap structures. An important problem to be addressed is the development of a theory of equations in multialgebras, in order to formally define varieties. This would allow to characterize hyperalgebras in an intrinsic way, making this topic closer to the discipline of universal algebras and of model theory. We will start this communication with a brief analysis of the logics of formal inconsistency, showing then how the swap structures are constructed and how they serve as an algebraic counterpart to LFI's such as mbC. We will show how swap structures can be treated as multialgebras, justifying then our passage to the abstract study of multialgebras. We will discuss its definition, as well as the possible definitions of homomorphism, subalgebra, product, term and identity, emphasizing here how there are still no preferable definitions in this context for each of these concepts. Finally we will use the approach of invariants by class operators to show some possible generalizations of Tarski's theorem for universal algebras. If there is time, we will also mention our recent research on freely generated multialgebras.

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