

## **Seminários Contínuos do Programa de Pós-Graduação em Matemática**

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### **Follow the Flow: sets, relations, and categories as special cases of functions with no domain**

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#### ABSTRACT

We introduce, develop, and apply a new approach for dealing with the intuitive notion of function, called Flow Theory. Within our framework functions have no domain at all. Sets and even relations are special cases of functions. In this sense, functions in Flow are not equivalent to functions in ZFC. Nevertheless, we prove both ZFC and Category Theory are naturally immersed within Flow. Besides, our framework provides major advantages as a language for axiomatization of standard mathematical and physical theories. Russell's paradox is avoided without any equivalent to the Separation Scheme. Hierarchies of sets are obtained without any equivalent to the Power Set Axiom. And a clear principle of duality emerges from Flow, in a way which was not anticipated by Category Theory.