

CATEGORY THEORY RESEARCH SEMINAR:

Aspects of 2-dimensional Elementary Topos Theory

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DATE: Tuesday, 4 June 2024 | 12h10 – 13h00 SAST

VENUES:

- Room 1006, Mathematics and Industrial Psychology Building, Stellenbosch University
- Online

ABSTRACT

We will present some original contributions to the recently born theory of 2-categorical elementary topoi. We will focus in particular on 2-classifiers, that are the 2-categorical analogue of subobject classifiers and thus arguably the main ingredient of an elementary 2-topos. The archetypal example of 2-classifier is given by the Grothendieck construction, that exhibits Cat as the archetypal elementary 2-topos.

We will show that the whole study of 2-classifiers can be reduced to dense generators and thus greatly simplified. To reach this result, we first need to understand colimits in 2-dimensional slice categories. We then apply the theorems of reduction of the study of 2-classifiers to construct a 2-classifier in stacks (and 2-dimensional presheaves), also thanks to an indexed version of the Grothendieck construction. This is the main part of a proof that 2-dimensional Grothendieck topoi are 2-dimensional elementary topoi.

BIOGRAPHY

I am about to conclude my PhD in category theory at the University of Leeds, UK, under the supervision of Nicola Gambino. My main research interests are category theory and its applications to logic, geometry and algebra. More precisely, I have a keen interest in Grothendieck fibrations and the Grothendieck construction, 2-category theory, enriched category theory and 2-categorical elementary topoi. I am very passionate about research and I am a positive person who always smiles. I value love, truth and communication. In my free time, I like travelling as well as creating and playing board games.

WHO SHOULD ATTEND?

All are welcome. It will be assumed that the audience is familiar with basic concepts of category theory.



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