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CATEGORY THEORY RESEARCH SEMINAR:

Principal bundles and quotient stacks over sites

Elena Caviglia (University of Leicester, UK)

DATE: Tuesday, 28 May 2024 | 12h10 – 13h00 SAST

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

ABSTRACT

Principal bundles over topological spaces are among the most studied objects in geometry and topology. In this talk we will present a new notion of principal bundle that makes sense in any site that has all pullbacks and a terminal object, and we will use it to generalize quotient stacks. The topological group involved in the standard notion of principal bundle becomes in general a group object in the category, and the notion of locally trivial morphism is generalized considering pullbacks along the morphisms of a covering family for the Grothendieck topology. After some preliminaries, we will present generalized principal bundles and we will see that they reduce to the classical principal bundles when the site is (Top, std), where Top is the category of compactly generated topological spaces and std is the standard Grothendieck topology, i.e. the covering families of a topological space coincide with its open coverings. We will use generalized principal bundles to construct generalized quotient prestacks and we will see that, if the site is subcanonical and the underlying category satisfies some mild conditions, generalized quotient prestacks are stacks. We will conclude the talk giving an idea of how the same theory of principal bundles and quotient stacks is developed one dimension higher in the two-categorical context of bisites.

BIOGRAPHY

I am about to conclude my PhD in Mathematics at the University of Leicester under the supervision of Frank Neumann. I am interested in Category Theory and its applications to Algebraic Topology and Algebraic Geometry. My main research topics are stacks and their cohomology theories and Grothendieck fibrations. I am a teaching assistant of the Adjoint School 2024 for the project "*Properties of Double Fibrations*", mentored by Dorette Pronk.

WHO SHOULD ATTEND?

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

REGISTER TO ATTEND:

https://buff.ly/4bNDJha

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