Homotopy Type Theory
Student Colloquium

May 30th 2014, 13.15 – 15.00

Homotopy type theory is a new branch of mathematics that combines and connects aspects of several different fields (topology, logic, category theory, etc.) in surprising ways. Briefly, logical constructions correspond to homotopy-invariant constructions on spaces, while theorems and proofs in the logical system are given a homotopical meaning.

In the colloquium we will aim to give the audience an introduction to the ideas, methods and results of the ongoing work in this area. The colloquium will consist of two talks with a break in the middle. The talks will be accessible to second year students who have seen some topology (in particular the notion of a homotopy between paths) but anyone interested is welcome!

Intended topics will be among the following:

- An introduction to *type theory*, which is the general framework for the theory.
- A proof of the *constructive axiom of choice* as it appears in the theory.
- An introduction to the new *axiom of univalence*, which allows one to treat isomorphic objects as identical.
- An introduction to *higher inductive types* which give new ways of conceiving and calculating with familiar objects such as the sphere.
- Time permitting we will try to show some actual topological calculations such as the fundamental group of the sphere.

Date: May 30th between 13.15 and 15.00
Place: Aud. 9.

/ Dan and Martin