



UNIVERSITÀ
DI TRENTO

Dipartimento di
Matematica

DOTTORATO



CYCLE 34th
ORAL DEFENCE OF THE PHD THESIS

Wednesday 29 June 2022 – at 2:00 pm
Seminar room “-1”

The event will take place in presence and online through the ZOOM platform.
To get the access codes please contact the secretary office

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Proof theoretical issues in Martin-Löf Type Theory and Homotopy Type Theory

Abstract:

Homotopy Type Theory (HoTT) is a quite recent branch of research in mathematical logic, which provides interesting connections among various areas of mathematics. It was first introduced by Vladimir Voevodsky as a means to develop synthetic homotopy theory, and further advancements suggested that it can be used as a formal foundation to mathematics. Among its notable features, inductive and higher inductive types are of great interest, e.g. allowing for the study of geometric entities (such as spheres) in the setting of HoTT.

However, so far in most of the literature higher inductive types are treated in an ad-hoc way; there is no easy general schema stating what an higher inductive type is, thus hindering the study of the related proof theory. Moreover, although Martin-Löf Type Theory has been deeply and widely studied, many proof theoretic results about its specific variant used in HoTT are folklore, and the proofs are missing.

In this final talk, we provide an overview on some results we obtained, aiming to address these problems. In the first part of the talk, we will discuss a normalization theorem for the type theory underlying HoTT. In the second part of the talk we will propose a general syntax schema to encapsulate a relevant class of higher inductive types, potentially allowing for future study of the proof theory of HoTT enriched with such types.

Supervisor: Roberto Zunino

Co-supervisor: Marco Benini

CONTATTI

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