Abstract

Course topics

In the 1980s A. Grothendieck suggest a project for developing a tame topology that will not suffer from the many counter-examples and pathologies known in classical topology. Nowadays many view the notion of o-minimality as successful fulfillment of this program: in o-minimal fields all (unary) functions are piecewise differentiable (and therefore infinitely differentiable at almost every point); unary functions are piecewise monotone, connectedness is the same as path connectedness and the axiom of choice holds for definable sets. In the o-minimal setting most of the classical differential calculus can be developed, and so are large portion of the theory of Lie groups, algebraic topology and much more. O-minimality plays a key role in real geometry and in recent years had a crucial role in important breakthroughs in Diophantine geometry and in Hodge theory.

In the course we will define o-minimality and develop its basic theory. We will show that real closed fields are o-minimal and discuss – time permitting – some applications.