Tame expansions of the real and complex fields

Juan Diego Caycedo

Abstract

The complex field and the real ordered field are prototypical examples of well-behaved structures from the model-theoretic viewpoint, although in rather different ways. Indeed, in both cases there is a certain geometric understanding of definable sets. Natural questions are what expansions of these structures introducing new definable sets admit similar results and where is there a dividing line between "tame" and "wild" expansions.

In the case of the real field, a rich theory has been developed for o-minimal expansions. Also, a meaningful division is obtained when tame expansions are defined to be those that do not define the set of integer numbers.

I will discuss the case of expansions of the complex field through several examples related to complex exponentiation and present joint work with A. Günaydın and P. Hieronymi on applying ideas from the complex case to a question about expansions of the reals.