Minisymposium 10 - The use of proof theory in mathematics

Logical Metatheorems and their Use in Functional Analysis and Hyperbolic Geometry

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In recent years logical metatheorems have been developed which guarantee the extractability of effective strongly uniform bounds from large classes of proofs in functional analysis and hyperbolic geometry. "Strongly uniform" refers to the fact that the bounds are independent from parameters in abstract metric, hyperbolic, CAT(0) or normed spaces as long as some local bounds on certain metric distances between these parameters are given.
We will present some recent applications in metric fixed point theory where this has led to effective uniformity results which not even ineffectively were known before. We also give a new extension of the previously known metatheorems by a powerful "nonstandard" uniform bounded principle and indicate its use.