

Speaker: Sam Sanders
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Tuesday, November 27, 2012
2:00 pm
125 Hayes Healy Hall

Title: Nonstandard Analysis: a new way to compute

Abstract:

The system ERNA is a version of Nonstandard Analysis based on $I\Delta_0 + EXP$. Recently, it was shown that many of the equivalences of WKL_0 over RCA_0 from Reverse Mathematics can be ‘pushed down’ into ERNA’s language, while preserving the equivalences, but at the price of replacing equality ‘=’ by ‘ \approx ’, i.e. equality up to infinitesimals from Nonstandard Analysis.

We overview these results concerning ERNA and provide a possible explanation for the above similarity/robustness. In particular, we introduce ‘ Ω -invariance’, a simple and elegant notion from Nonstandard Analysis meant to capture the notion of algorithm. Intuitively, an object is Ω -invariant if it does not depend on the *choice* of infinitesimal used in its definition.

We consider results regarding Ω -invariance in classical and (time-permitting) constructive Reverse Mathematics.