MINISYMPOSIUM ON CATEGORICAL LOGIC

Onsdag 17 december kl. 10.00–15.00, rum 2215,
MIC, Polacksbacken, Uppsala.

Anders Kock, Aarhus. The topos logic of "internal".

Kl. 10.00–11.00

Abstract: In non-standard analysis, higher order notions only admit transfer to the extent that they are modified so as to apply to internal entities. We provide an elementary topos that captures this modified logic.

Carsten Butz, IT University of Copenhagen. Saturated models for intuitionistic theories.

Kl. 11.15–12.15

Abstract: Call a model of a first-order theory saturated if an arbitrary family of first-order formulae is realised (satisfied) by some element of the model precisely when every finite subset of formulae is realised. The notion of saturation is one of the back-bones of modern model theory.

In this talk we show how saturated models can be constructed using the language of categorical logic. Our main result exhibits, for each (intuitionistic) first-order theory, a topos which contains such a saturated model. As applications we will discuss the thus constructed model of Heyting arithmetic (HA), which was first investigated by Moerdijk, and a conservativity result for classical first-order logic: Infinitary logic, which is first-order logic extended by disjunctions and conjunctions over arbitrary sets of formulae, together with rules stating complete distributivity and that existential quantification distributes over filtered conjunctions, the syntactic analogous of the saturation property, is conservative over finitary first-order logic. The last mentioned result has potential applications to a development of non-standard analysis without using the machinery of model theory.

The talk will focus on an overview of the results and their meaning.

Steve Awodey, Carnegie Mellon University. Categories of classes.

Kl. 14.00–15.00

Abstract: This talk reports on recent joint work with C. Butz, A. Simpson, and T. Streicher on using categorical logic to construct natural models of various elementary set theories.