

**Speaker:** Alex Wilkie  
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Monday, December 6, 2010  
3:00 pm  
126 DeBartolo Hall

**Title:** Some Model Theory for Analytic Functions

**Abstract:**

General model-theoretic criteria for quantifier elimination and model completeness of first order theories; QE for the real ordered field.

A review of Noetherian rings and modules; the Hilbert Basis Theorem; power series rings, the formal Division Theorem, Weierstrass Preparation Theorem and van den Dries/Denef Preparation Theorem.

Analytic functions in many variables on the reals and complexes. Analytic Division Theorem and Preparation Theorem.

Flatness and the deduction of the Analytic van den Dries/Denef Preparation Theorem from the formal version. (There is a lot of algebra here and, though beautiful, it might be omitted if time is pressing.)

Definition of the first order structure  $\mathbb{R}_{an}$  and failure of QE(Osgood's example). The QE of the theory of this structure with a symbol for division following essentially the van den Dries/Denef method but using the model-theoretic criteria discussed above. O-minimality as a consequence.

Other topics au choix.