

UIC Model Theory Seminar, April 4, 2006

**Characterizing definable closure in certain o-minimal expansions
of real closed fields, with applications**

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Every closed subset of euclidean space can be represented as the zero set of a smooth function (ie an infinitely differentiable function defined on the whole ambient space). My student, Gareth Jones, has been investigating the question of whether this theorem (of Whitney) holds in the context of sets and functions definable in an o-minimal expansion of the real exponential field. This turns out to require uniform estimates on all derivatives of a given definable function. In many structures of interest these estimates are easily seen to hold for the terms of the language, so the problem becomes one of finding analytic operations, mapping definable functions to definable functions, which (a) preserve the estimates and (b) eventually generate all definable functions. This is the topic of my talk.