

Speaker: **John Baldwin**
University of Illinois - Chicago

Thursday, March 28, 2013
2:00 pm
Room: 125 Hayes-Healy Hall

Title: Three Red Herrings Around Vaught's Conjecture

Abstract:

We will survey work of Julia Knight, Greg Hjorth and Chris Laskowski/Saharon Shelah finding complete sentences in $L_{\omega_1, \omega}$ that have no model in \aleph_2 . We find various similarities and dissimilarities among the examples. In particular each gives the stronger result: every model in \aleph_1 is maximal. Hjorth ostensibly applied descriptive set theory to deduce from his example that if there is a counterexample to Vaught's conjecture there is one with no model in \aleph_2 . We show this is a model theoretic argument which applies equally well to the Laskowski-Shelah example.

Hjorth's work suggested a strategy for establishing Vaught's conjecture. Unpublished results of Harrington show that every counterexample has models with arbitrarily large Scott ranks below \aleph_2 . This supports the notion that one might construct a model of an arbitrary counterexample that has cardinality \aleph_2 and thereby establish the theorem.

We have identified three red herrings: a) that descriptive set theory plays a central role in Hjorth's result, b) that the existence of a model in \aleph_2 is crucial. (It is rather the embeddability relation in \aleph_1 is key.) and c) that Harrington's result analyzing complexity of individual models rather than the embeddability relation is a sufficient tool.

This is a result of discussions with Sy Friedman, Martin Koerwien, Chris Laskowski and Tapani Hyttinen. A joint paper is being prepared.