



**Speaker:** Russell Miller  
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Tuesday, April 8, 2014  
11:00 AM  
125 Hayes-Healy Hall

**Title:** Degree spectra of differentially closed fields

**Abstract:**

The spectrum  $\text{Spec}(M)$  of a countable structure  $M$  is the set of all Turing degrees of structures isomorphic to  $M$ . This topic has been the focus of much research. Here we describe the spectra of countable differentially closed fields of characteristic 0: they are precisely the preimages  $\{d : d' \text{ in } \text{Spec}(G)\}$  of spectra of arbitrary countable graphs  $G$ , under the jump operation. To establish this, we describe the proofs of two theorems: one showing how to build the appropriate differential field  $K$  from a given graph  $G$ , and the other showing that every low model of the theory  $\text{DCF}_0$  is isomorphic to a computable one. The latter theorem (which relativizes, to give the main result above) resembles the famous result of Downey and Jockusch on Boolean algebras, but the proof is different, yielding a  $\Delta_2$  isomorphism between the low model and its computable copy; moreover, our first theorem shows that the extension of the result to the low<sub>4</sub> case for Boolean algebras ! does not hold for  $\text{DCF}_0$ .