

Speaker: Karen Lange
Wellesley College

Tuesday, March 22, 2016
2:00 pm
Room: 125 Hayes-Healy Hall

Title: Lengths of roots of polynomials over $k((G))$

Abstract:

Mourgues and Ressayre showed that any real closed field R can be mapped isomorphically onto a truncation-closed subfield of the Hahn field $k((G))$, where G is the natural value group of R and k is the residue field. If we fix a section of the residue field and a well ordering \prec of R , then the procedure of Mourgues and Ressayre yields a canonical section of G and a unique embedding $d : R \rightarrow k((G))$. Julia Knight and I believed we had shown that for a real closed field R with a well ordering \prec of type ω , the series in $d(R)$ have length less than ω^{ω} , but we found a mistake in our proof. We needed a better understanding of what happens to lengths under root-taking. In this talk, we give a partial answer, which allows us to prove the original statement and generalize it. We make use of unpublished notes of Starchenko on the Newton-Puiseux method for taking roots of polynomials.