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*Quantifier elimination and uniform bounds for oscillatory integrals*

This talk will be largely about the recent work of R. Cluckers and I. Halupczok (and our completed long-term joint project), which gives a new way to use model theory to get uniform bounds for families of oscillatory integrals, both over the  $p$ -adic fields and over the reals. I will give an introduction to the relevant results from model theory (the so-called “quantifier elimination” and “cell decomposition” theorems which go back to the work of Tarski in the 1930s and Jan Denef in the 80s), and then focus on less known applications that lead to uniform bounds for various functions that arise in representation theory.