

## ***MODEL THEORY SEMINAR***

**Guest Speaker: Chieu Minh Tran**  
**University of Notre Dame**

***Date:*** Tuesday, September 3, 2019

***Time:*** 11:00 AM

***Location:*** 125 Hayes-Healy Hall

***Lecture Title:***

**O-minimal methods and generalized sum-product phenomena**

***Abstract***

Using tools from o-minimality, we prove that for two bivariate polynomials  $P(x, y)$  and  $Q(x, y)$  with coefficients in  $\mathbb{R}$  or  $\mathbb{C}$  to simultaneously exhibit small expansion, they must exploit the underlying additive or multiplicative structure of the field in nearly identical fashion. This in particular generalizes a result of Shen and yields an Elekes–Ronyai type structural result for symmetric non-expanders, resolving an issue in a survey by de Zeeuw. Our result also places sum-product phenomena into a more general picture of model-theoretic interest.