

The SUMO Speaker Series for Undergraduates

Thursday, April 30

4:15-5:05, Room 380C

(Food Provided)

Transfinite Tricks for Naming Large Numbers

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Abstract. In a contest to see who can describe the largest integer, a clever contestant will say "one greater than the maximum of the others." After tightening the rules to prevent problems arising from entries of this sort, strategies for defining large numbers typically use functions with rapid growth rates (exponential, iterated exponential, ...). We take this approach to the extreme by iterating rapidly growing functions indexed on infinite ordinal numbers. The result is integer-valued functions with incredible growth rates, and they are more than just a curiosity – they are used in mathematical logic to measure the complexity of proofs, displaying a strong connection between provability and computability. This leads to the strategy of unraveling strong axiom systems to define large integers, which can be viewed as a consistent way to go "one greater than the max of the others" in the largest integer contest. This path to defining large integers leads to an overview of major results in logic and set theory.

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