

# MTCS COLLOQUIUM

**Michael Adams**

will present

## COUNTING

3:30 pm

Tuesday, March 24th

Violette Hall 1236

*“Standard mathematics has recently been rendered obsolete by the discovery that for years we have been writing the numeral five backward. This has led to a reevaluation of counting as a method of getting from one to ten.”*

Woody Allen, in “Getting Even.”

How many ways are there of making  $k$  selections from a set with  $n$  elements? This question usually appears in a variety of guises; for example, counting poker hands, seating arrangements around a circular table, or the number of ways to select officers for a club. To answer this question, we must first answer the following three questions: Are selections made with or without replacement? Are elements in the set individually distinguishable or distinguishable only by type? Does order matter in how the selections are made? In this talk I will discuss counting techniques that account for the various ways of making selections with or without replacement, distinguishability by item or type, ordered or unordered. As an illustration of these techniques, we will derive formulas for counting the ways two DNA sequences can be aligned, allowing for substitutions and indels.

**Cookies and Refreshments!!!**