The SUMO Speaker Series for Undergraduates
Thursday, May 9th
4:15-5:05, room 380C
(Food Provided)

The Prime-generating Sequence that Couldn't
Professor Tom Church

ABSTRACT:

Define a sequence of integers by $a_0 = 3$, $a_1 = 0$, $a_2 = 2$, and then recursively by $a_{n+3} = a_n + a_{n+1}$:

3   0   (2)   (3)   2   (5)   5   (7)   10   12   17

(22)   29   (39)   51   68   90   (119)   158   (209)   277

Calculate out a few terms, or a few thousand, and you'll notice a curious pattern: the n-th term a_n is divisible by n exactly when n is prime! This pattern can't go on forever, but the first counter-example is $n = 271,441$, for which a_n has over thirty thousand digits. I'll give three explanations for the success and eventual failure of this prime-generating sequence: one using graph theory, one using number theory, and one using a tiny necklace-inspecting robot.

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