

# UCCS MATH COLLOQUIUM LECTURE

Dr. Gene Abrams, UCCS Math Dept

The Ubiquity of the Fibonacci Sequence:  
It comes up in the study of Leavitt path Algebras too!

Thursday, September 18, 2014

12:30-1:30pm (refreshments at 12:15pm)

Osborne A327

The majority of this talk should be quite accessible to math majors, to graduate students, even to math faculty: indeed, to anyone who has heard of the Fibonacci sequence ... Since its origin (more than eight centuries ago) as a puzzle about the number of rabbits in a (fantasmagorically expanding) colony, the Fibonacci Sequence 1, 1, 2, 3, 5, 8, 13, ... has arguably become the most well-known of numerical lists, due in part to its simple recursion formula, as well as to the numerous connections it enjoys with many branches of mathematics and science. Since its origin (less than ten years ago), the study of Leavitt path algebras (a type of algebraic object which arises from directed graphs) has been the focus of much research throughout the mathematical world (well, at least throughout the ring-theory world), especially here at UCCS. In this talk we'll show how Fibonacci's sequence is naturally connected to data associated with the Leavitt path algebras of a natural collection of directed graphs. No prior knowledge about Leavitt path algebras will be required. [But in fact we will show how to compute the Grothendieck group  $K_0(L(E))$  of the Leavitt path algebra  $L(E)$  for a directed graph  $E$ , by considering only elementary-level properties of the graph. Those properties will lead us directly to Fibonacci. Plenty of easy-to-see examples will be given.] This is joint work with Gonzalo Aranda Pino of the University of Malaga (Spain).

