# MANY CHEERFUL FACTS

presents

## Graph Theory and Ring Theory are Friends - Zero Divisor Graphs of Rings

a talk by Alex Diesl

1:10 pm - 2:00 on Wednesday, November 9nd, in room 1015.

The notion of the zero-divisor graph of a commutative ring was invented by Beck in 1988. These days, the most common defintion for this invariant is as follows. Let $V$ be the set of all non-zero zero-divisors of a (finite) ring $R$. The zero divisor graph $\Gamma(R)$ has vertex set $V$ with an edge drawn from $x$ to $y$ if $xy = 0$ in $R$. I will explain some of the results that have been proven so far in this area, including the (very cheerful) fact that (with only two exceptions) a finite reduced commutative ring is completely determined by its zero-divisor graph.

I'll then explain why finte reduced commutative rings are ridiculous and why you should take Math 251 next semester. Finally, time permitting, I'll explore some non-trivial generalizations of zero-divisor graph to the non-commutative or ideal-theoretic cases.nctors of categories and show how they give topological invariants.

*I am the very model of a modern Major General,*
*I've information vegetable, animal, and mineral,*
*I know the kings of England, and I quote the fights historical*
*From Marathon to Waterloo, in order categorical;*
*I'm very well acquainted, too, with matters mathematical,*
*I understand equations, both the simple and quadratical,*
*About binomial theorem I'm teeming with a lot o' news,*
*With many cheerful facts about the square of the hypotenuse!*

- Gilbert & Sullivan $P \circ P$