MANY CHEERFUL FACTS

presents

Categorification: Part II

a talk by George Melvin

2:10–3:00pm on Tuesday, April 28, in 939 Evans.

I ran out of time last week so I plan to swiftly recover what I stated last time and actually get on to the categorification aspects.

Below is the spiel I gave for last weeks talk, this week I will move things along at a quicker pace. Expect quivers, reflection functors, Weyl groups and root systems. I may try to waffle about Hall algebras if there is time.

In this talk we will present some categorified examples of relatively simple notions. In their paper 'Coxeter Functors and Gabriel's Theorem', Bernstein, Gelfand and Ponomarev (BGP) gave a proof of Gabriel's Theorem by introducing a categorified notion of a reflection in Euclidean space. We will see what Gabriel's Theorem states and study the BGP proof. Along the way we will learn about rigid Euclidean geometric objects (root systems), grown-up linear algebra and how, by categorifying the group of symmetries of a root system, Gabriel's Theorem pops out quite naturally.

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, $P \circ P$

The website for Many Cheerful Facts is
`http://math.berkeley.edu/~mcf/`