

MANY CHEERFUL FACTS

presents

Presheaf, the cobbler.

a talk by David Spivak

12:10 – 1:00pm on Wednesday, May 2, in room 1015.

Children have always loved colimits. Whether it be sorting their blocks according to color, gluing a pair of googly eyes and a pipe-cleaner onto a piece of yellow construction paper, or simply eating a peanut butter sandwich, colimits play a huge role in their lives.

But what happens when their category doesn't have enough colimits? In today's "ownership" society, what usually happens is that the parents upgrade their child's category to a Presheaf category. Then the child can cobble together crazy constructions to his heart's content.

Sometimes, a kid comes up to you with an FM radio she built out of tinkertoys, and says "look what I made! I call it '182 transisters, 11 diodes, 6 plastic walls, 3 knobs,..." They seem to go on about the damn thing forever. Luckily, Grothendieck put a stop to this madness. He used to say to them, ever so gently, "I'm sorry, kid. I'm really proud of you for making this '182 transistors' thing, but I'm afraid it already has a name. It's called a radio." And thus Grothendieck apologies were born. Two years later, Grothendieck topologies were born of the same concept.

In this talk, I will teach you to build a radio (that really works!) using only a category of presheaves, and then I will tell you about the patent-police, known as Grothendieck topologies. God willing, I will get through SGA 4 and Lurie's book on Higher Topos Theory.

*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://www.math.berkeley.edu/~slofstra/mcf>