

MANY CHEERFUL FACTS

presents

Tiling and Generalizing Pythagorus's Theorem

a talk by Soroosh Yazdani

1:10 pm - 2:00 on Wednesday, October 12th, in room
1015.

Say you are a number theorist and you want to solve some Diophantine equation. The obvious Diophantine equation is, of course,

$$x^2 + y^2 = z^2.$$

Unfortunately, this was solved quite a while ago, and the solution was fairly easy. If you are Fermat, you claim you can generalize the problem to $x^n + y^n = z^n$, and that the only non interesting solutions are the ones that we already knew about. Unfortunately, now days, if you make such a claim, you probably need to justify this claim, which is pretty difficult. This obstruction has not stopped people from making the claim that

$$x^a + y^b = z^c$$

does not have any interesting solutions when a , b , and c are all large.

In this talk, we will look at the converse to the above claim, that is we ask, when can we find interesting solutions to $x^a + y^b = z^c$, and we'll try to relate it to tiling of the plane.

*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 o P*