The Simplest Thing I Don't Know About Four Dimensional Space

April-14-13
3:14 PM

For talk at CUMC, Montreal July 10-14, 2013?

Abstract. I'll tell you about a topology question that happens in 4-dimensional space, something about 2-dimensional knots in 4-dimensional space. A large class of such knots can be obtained by "inflating to 4D" some 1-dimensional things called "w-knots" that originally live in 3D (and in fact, essentially in 2D). And I, meaning "I and everybody I'm aware of", don't know if whenever two such 2D knots in 4D are equivalent (in the appropriate sense) in 4D, they were equivalent already in 3D (in the appropriate sense). In other words, I don't know if my language for describing 4D things on paper (namely, in 2D) is "complete". Would you help?

The "movie language", the "projection language", and (learn modesty!) the "double inflation language"

Things to animate:

1. Some 3D knots floating in space.
2. Some 3D knots in the movie language and in the projection language.
3. The Reidemeister moves.
4. Some 4D knots in the movie language and in the projection language.
5. Movie moves and Roseman moves.
6. The double inflation language - "ribbon knots".
7. Ribbon knots in the movie language and in the projection language.
8. The w-moves in all languages.