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Richard Evan Schwartz*, 177 Weyl Lane, Princeton, NJ 08540. *Rectangles, Curves, and Klein bottles.*

The rectangular peg problem is a variant of the notorious square peg problem of Toeplitz, which goes back to to 1911 and asks if every continuous loop contains an inscribed square - i.e., 4 points which form the vertices of a square. The square peg problem has long been known to be true for smooth or polygonal loops, and the case of wild fractal curves is unsolved and is what keeps people up at night.

One can make an even bolder conjecture: Every continuous loop contains an inscribed rectangle of every possible aspect ratio. Until the very recent work of Greene and Lobb, this had been unknown even for smooth loops, though Cole Huguemeyer had made some inspiring progress on it.

In this talk I will exposit the work of Greene and Lobb as best I can. Their basic idea is to look at the problem in "symplectic coordinates" and, through a surgery construction, reduce the problem to the statement that a certain kind of Klein bottle cannot be embedded in 4 dimensions. This is a bit peculiar because Klein bottles famously do have 4-dimensional embeddings. The key is that the extra constraints make it impossible. (Received September 15, 2020)