

---

**MIKE MILLER EISMEIER**, University of Vermont

*ASD connections and cosmetic surgery*

The cosmetic surgery conjecture predicts that, given a knot  $K$  in a 3-manifold, the oriented diffeomorphism type of surgery on  $K$  determines the surgery slope (up to oriented diffeomorphism). For knots in the 3-sphere, a sequence of restrictions coming from Heegaard Floer homology implies that if the cosmetic surgery is false for  $K$ , then  $r$ -surgery on  $K$  is not oriented diffeomorphic to  $(-r)$ -surgery, for some  $r$  in  $\{2, 1, 1/2, 1/3, \dots\}$ .

I will discuss how a quantitative enhancement of instanton homology rules out the cases  $r = 1/n$ , leaving only the possibility of 2-surgery.