

A picture is worth a thousand words

I am a firm believer of the dictum “A picture is worth a thousand words”. I always prefer proofs by pictures to proofs by words, and I try to keep my papers free from excess verbiage. There are only so many operations, with which you can build 4-manifold handlebodies, from the basic pieces. In [A1] I listed most of these operations and gave recipes how to apply them. Sometimes you need to gaze a handlebody long time to see how its put together (via corks, plugs, gluck constructions..etc). Identifying these pieces correctly could give you unexpected big results. For example, just by looking at a ribbon complement in a different way by these methods, gave me the solution of the long standing ‘Scherleman Problem’ [A2], with which I was able to construct ‘a Fake Cusp, and a Fake Fishtail’ [A3], and in turn this enabled me to construct long sought-after handlebody picture of the ‘Fintushel-Stern knot surgery operation’. These were my 1999 papers, not mere “Kirby diagrams” as some people might think.

(It looks like Kirby doesn’t agree with me; because in minute 52 of his zoom talk [K] he says “Every single one of my coauthors did majority of writing, except Selman Akbulut, who doesn’t write so well, English is not his native language”, forgetting that I spent 57 years of my life in US :)

Proof-by-pictures has one disadvantage of making your papers vulnerable to plagiarism. Traditionally, pictures are used as illustrations to back up for an existing proof, not as proofs themselves, Not my proofs! In my papers the pictures are usually the proofs themselves. This could give some people an impression that they’re free for taking, even though you might have spent years to discover it, to make your proof work. Here is an example: When I proved [A2], I was in MSRI, so was my friend Andras, who was busy writing his book [GS]. He wanted to know how I could draw the handlebody picture of Fintushel-Stern knot surgery operation. First I said “I won’t tell you before my paper appears”, but after he persisted with “I promise, I won’t tell anybody!”, I complied.. But a few months later to my surprise, I noticed, that picture appeared in Figure 10.2 of [GS], when I asked him “what happened?”, he said he doesn’t remember what happened, “maybe Gompf did the same thing”.

REFERENCES

- [A1] S. Akbulut, *4-Manifolds*, OxfordUP (2016)
- [A2] S. Akbulut, *Scharlemann’s manifold is standard*, Ann of Math., 149 (1999) 497-510.
<http://www.selmanakbulut.com/papers/schar.pdf>
- [A3] S. Akbulut, *A Fake Cusp and a Fishtail*, Turkish Jour of Math, 23 (1999), no1, 19-31;
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- [GS] R.Gompf and A.Stipsicz, *4-Manifolds and Kirby calculus Grad Studies in Math,20*
[K] R.Kirby <https://www.youtube.com/watch?v=v0a0T1RJa-Q&t=1702s>