Around Cellular and CW-complexes

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Cellular, and CW complexes in particular, are extremely powerful and useful constructions in many different areas of topology primary because they are easier to understand than just an arbitrary topological space. A lot of invariants (like homology, homotopy groups) work better for them in a sense that we know, to some extend, how to compute them as well as maps between cellular complexes go in a simple way as one would expect. What is even better is that we can approximate any topological space with a CW complex.

The idea of the course is to introduce cellular and CW complexes alongside with homotopy maps and groups and finish by sketching together the proof of either cellular approximation theorem or CW approximation theorem. We are gonna see a lot of examples which, as an instance of almost any topological things, easy to visualize. The examples include spheres, wedges of circles, projective planes both complex and real, torus of different genus etc.

Throughout the course, we will try to combine problem-solving with elements of general theory. We will work through and discuss some problems related to the subject together.

It is also worth mentioning that I am very flexible regarding the topics we cover. So, don't worry if something seems unfamiliar, we are here to learn it together!

Prerequisites: Since I would rather assume that nobody is familiar with homotopical algebra then the only necessary thing is to know what continuous map is and have a feeling what a topological space is.

If someone is interested in this topic but already knows the basics let me know, I can try to prepare more complicated exercise sheet, so you also would have fun!