TMA4500: Projects

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I can supervise students who wish to do projects in either

- Differential Topology, or
- Algebraic Topology.

Briefly, *topology* is the study of "things with locality"; namely a *topological space* is a set together with the extra structure needed to know what the word "local" means. Topology itself is a very broad topic in mathematics and finds applications across the whole discipline. Therefore we often subdivide topology according to how one is approaching a particular problem. Two of these subdivisions are *differential* topology and *algebraic* topology.

- **Differential Topology** is concerned with problems in topology that can be studied using calculus. It focusses mainly on *manifolds* (being the "right place" to do calculus). It has found application in many areas of mathematics and physics, in particular through *differential geometry*.
- **Algebraic Topology** is concerned with problems in topology that can be studied using algebra. The main techniques in algebraic topology involve converting a topological problem into a simpler algebraic one. Often one looks for algebraic invariants to classify some topological idea or for algebraic obstructions to doing some topological construction. The most common "conversion" tools are *homotopy* and *homology*.

If you are interested in doing a project in either of these two areas, do come and talk to me.