



Vienna School  
of Mathematics

# PhD Colloquium

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## How to build 3-manifolds

A manifold is a topological space that is Hausdorff, second countable, and locally homeomorphic to Euclidean space. While it is relatively easy to visualize 0-, 1-, and 2-dimensional manifolds, it becomes more challenging to picture the higher-dimensional ones. In the case of dimension 3, we can only imagine the local model, the 3-dimensional Euclidean space. However, by adopting certain conventions, we can go beyond that and develop a certain feeling for what 3-manifolds look like.

In this talk, I will discuss and survey various methods for constructing and visualizing 3-dimensional manifolds: triangulations, Heegaard splittings, and surgery diagrams. The goal is to sketch the proof of the Lickorish-Wallace theorem.

If time permits, I will also discuss the relationship between 3-dimensional and 4-dimensional topology through handle decompositions.

**15 June, 14:00 – 14:45**

**SR8 (2nd floor)**

**Oskar-Morgenstern-Platz 1**