

Interactions between Geometry and Topology: Classic and Current

Description: The course will deal with a variety of topics concerned with relations between geometry and topology. The specific topics to be dealt with are expected to be driven in large part by interests of participating students. Examples of possible topics include:

- Exotic Spheres and their Geometry
- Geometry and Topology of Complete Nonnegatively Curved Manifolds
- Geometry and Topology via Morse Theory
- Critical Point Theory for Distance Functions
- Riemannian Center of Mass and Optimal Transport
- Compact Transformations Groups via Geometry and Topology of Orbit Spaces
- Curvature and Characteristic Classes
- ...

The list goes on.

Prerequisites: Knowledge corresponding to the Basic Geometry/Topology course (60330) is expected and its Geometry sequel (60670) is expected. - Since a whole semester could be used for an in depth treatment of any of these topics, the purpose of the course is to provide an appealing glimpse of a variety of topics, and to get acquainted with a number of different tools and techniques. This of course also means that some facts will be discussed and used without proofs.

Due to the nature of the course the needed material, weather it is from books or research papers depends on the topics chosen.

Interested students are encouraged to contact me prior to the start of the semester with topics of interest to them. Once some topics are chosen, I will provide information about relevant texts. Until then, the course could turn out to be

Topics in Comparison Geometry

Lectures: Monday and Wednesday 2:00–3:15 in DBRT 302.

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