

Introduction to contact geometry and topology

Gianluca Bande

In these lectures I give an introduction to contact geometry and topology. In particular the following arguments will be treated:

- Definition and examples of contact structures and of contact manifolds.
- Links with symplectic geometry.
- Submanifolds of a contact manifold: Legendrian submanifolds, Legendrian and trasverse knots on a3-dimensional contact manifold.
- Gray stability theorem, Darboux's theorem and neighborhood theorems.
- Existence of contact structures on three manifolds: Lutz twist and Lutz-Martinet theorem.
- Tight versus overtwisted: Eliashberg result.
- Open books and contact structures.

The main reference will be the book of Geiges [1]. More material will be given during the lectures.

Prerequisites are: the knowledge of differentiable manifolds, exterior forms, some basic notions of homology and cohomology theory.

References

- [1] H. Geiges, *An introduction to contact topology*, Cambridge Studies in Advanced Mathematics, **109**, Cambridge University Press, Cambridge, 2008.