LAGRANGIAN GEOMETRY AND TOPOLOGY

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⬥ OUTLINE

This series of lectures is dedicated to Lagrangian submanifolds and their special role in symplectic geometry. We shall start by introducing Lagrangian submanifolds and explain how they appear in various problems of symplectic geometry, Hamiltonian dynamics and algebraic geometry. Next we shall make a tour into the zoo of geometric phenomena related to Lagrangians, their topology and their intersections properties. We shall then explain the mathematical techniques and (infinite dimensional) Morse theory developed to study Lagrangian submanifolds. In particular we shall outline Floer's theory, as well as its further recent extensions. Finally we shall present recent applications of the theory of Lagrangian submanifolds to questions arising in pure algebraic geometry and singularity theory.

Lecture 1: Lagrangian submanifolds & their classical invariants
Lecture 2: Rigidity phenomena, Lagrangian intersections & Floer homology
Lecture 3: Lagrangian intersections versus non-intersections & further aspects of Floer theory
Lecture 4: Applications to algebraic geometry

⬥ BIBLIOGRAPHIC REFERENCES

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