Sub-Riemannian Geometry

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Timetable: 16-20 hrs. April 2020, Torre Archimede, Room 2BC/30.

Course requirements: basic differential geometry

Examination and grading:

SSD: MAT/05

Aim: Sub-Riemannian geometry is the geometry of a world with nonholonomic constraints. In such a world, one can move, send and receive information only in certain admissible directions but eventually one can reach every position from any other. In the last two decades sub-Riemannian geometry has emerged as an independent research domain impacting on several areas of pure and applied mathematics, with applications to many areas such as quantum control, image reconstructions, robotics and PDEs.

The first part of the course is mainly an introduction to the subject towards theory and examples coming from applications such as mechanics. The second part focuses on more advanced questions, providing students to recent progress in the field and open questions.

Course contents:
Part 1

Part 2
The second part will focus on different questions around abnormal extremal and length-minimizers, with discussions on recent advances and open questions.

References: