Sub-Riemannian Geometry

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Timetable: 16 hrs. First lecture on April 13, 2021, 14:30. The course will be held online from prof. Andrei Agrachev with the follow calendar:
Tue April 13, 20, 27 at 14:30; Wed April 14, 21, 28 at 12:30 and Thu April 15, 22 at 11:30.
Link Zoom to the course: This is a recurring meeting Meet anytime:
https://unipd.zoom.us/j/81394988324 - Meeting ID: 813 9498 8324

Starting from March 17, 12:30, Torre Archimede, at the same link Zoom, a previous part of the course, addressed to students of Scuola Galileiana, but warmly recommended also to PhD Students, will be held by prof. Davide Barilari according to the follow calendar:
Tue March 23, 30 at 14:30; Wed March 17, 24, 31, April 7 at 12:30 and Thu April 8 at 11:30.

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 fist 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: