CENTRO DE MATEMÁTICA
UNIVERSIDADE DO PORTO

GEOMETRY AND TOPOLOGY SEMINAR

The Sard conjecture on Martinet surfaces

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Abstract. Given a totally nonholonomic distribution of rank two Δ on a three-dimensional manifold M, it is natural to investigate the size of the set of points $\mathcal{X}^x$ that can be reached by singular horizontal paths starting from a same point $x \in M$. In this setting, the Sard conjecture states that $\mathcal{X}^x$ should be a subset of the so-called Martinet surface of 2-dimensional Hausdorff measure zero.

In this seminar, I present a reformulation of the conjecture in terms of the singular behavior of a vector field. Next, I present a recent work in collaboration with Ludovic Rifford where we show that the conjecture holds whenever the Martinet surface is smooth. Moreover, we address the case of singular real-analytic Martinet surfaces and show that the result holds true under an assumption of non-transversality of the distribution on the singular set of the Martinet surface. Our methods rely on the control of the divergence of vector fields generating the trace of the distribution on the Martinet surface and some techniques of resolution of singularities.

No previous knowledge in sub-Riemannian geometry is necessary.

MONDAY, MAY 29 **15H30** **ROOM 1.09**

Please note the unusual day

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