Jets of foliations

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Regular subbundles of the tangent bundle, called distributions, play an important role in both differential geometry and dynamical systems. Both involutive distributations, corresponding to foliations, and non-involutive distributions, e.g. contact structures, can be used to describe dynamics on a manifold.

In this talk we will study distributions around submanifolds which are "involutive up to a certain order". That is, only the k-th jet of the Lie bracket of two vector fields will land in the distribution again. We will then study whether one may modify such a distribution so that it may become involutive up to a higher order. Although this is a rather elementary question, the answer involves the theory of Lie algebroids, groupoids, Morita equivalence and Van Est morphisms. This is a joint work in progress with Alvaro del Pino and Francis Bischoff.