Sub-Riemannian structures on infinite dimensional manifolds

Erlend Grong (University of Bergen, Norway)

Time **Friday, June 22, 2012 at 2pm**
Place **Campus Kirchberg, room A17**

Ever since Arnold in 1966 showed that the Euler equation for an ideal fluid can be thought of as geodesic equations with respect to a Riemannian structure on the group of volume preserving diffeomorphisms, there has been an interest in developing a theory of Riemannian manifolds for infinite dimensional manifolds. Several known PDEs, such as the Burgers' equation and KdV, can be seen as geodesic equations in this framework. The topic of the talk will be to discuss a generalization of sub-Riemannian manifolds to the infinite dimensional setting. A sub-Riemannian manifold is a manifold with a metric that is only defined on a subbundle of the tangent bundle. Such manifolds appear in kinematic systems where there is a nonholonomic constraint, but also other types of systems, such as charged particles under the influence of the Lorentz force, can be given a sub-Riemannian interpretation. The talk will describe the generalization and the motivation behind it, and will also give some examples.