JS LEMAY, University of Oxford
Differential Categories and Representable Tangent Categories

Differential categories were introduced to provide categorical models of differential linear logic and in particular come equipped with a natural transformation d, called the *deriving transformation*, whose axioms are based on basic properties of the derivative. CoKleisli categories of differential categories are very well studied as they provide models of the differential λ-calculus, but co-Eilenberg-Moore categories of differential categories are not as well studied. Tangent categories are categories which come equipped with an endofunctor T whose axioms capture the basic properties of the tangent bundle of a smooth manifold. The link between synthetic differential geometry and tangent categories is captured by the notion of a representable tangent category, which is a tangent category such that $\mathsf{T} = (-)^{\mathsf{D}}$ for some object D known as an infinitesimal object. In this talk we explain how a co-Eilenberg-Moore category of a differential category with sufficient equalizers is a representable tangent category, and also how every Eilenberg-Moore category of a codifferential category is a tangent category.