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Title: Geometry of diffeomorphism groups, complete integrability and optimal transport

Abstract: I will consider the geodesic equation on the space of densities on a compact manifold equipped with a certain right-invariant Sobolev  $\dot{H}^1$ -metric. It turns out that this equation is a completely integrable system in any space dimension whose solutions can be given explicitly.

Moreover, the underlying space is isometric to a subset of a sphere and this leads to some surprising connections with optimal transport and geometric statistics. This is joint work with B. Khesin, G. Misiolek, and S.C. Preston. Paper reference: arXiv:1105.0643.