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**Title: Conjugate Points on  $\mathcal{D}\mu(S)^2$  - but what are they, really?**

**Abstract:**

This talk gives a brief history of the geometry of the volume-preserving diffeomorphism group and its relationship to the Euler equations of hydrodynamics, with a particular emphasis on conjugate points and their physical interpretation. Recent examples of conjugate points in the volume-preserving diffeomorphism group of the sphere will be presented, along with heuristics for what they describe in physical fluid flows.