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Title: "The h-principle for the Euler equations"

Abstract: The talk is based on recent joint work with Camillo De Lellis. We construct continuous weak solutions of the 3d incompressible Euler equations, which dissipate the total kinetic energy. The construction is based on the scheme introduced by J. Nash for producing C^1 isometric embeddings, which was later developed by M. Gromov into what became known as convex integration. Weak versions of convex integration (e.g. based on the Baire category theorem) have been used previously to construct bounded (but highly discontinuous) weak solutions.

The current construction is the first instance of Nash's scheme being applied to a PDE which one might classify as "hard" as opposed to "soft".

The solution obtained by our scheme can be seen as a superposition of infinitely many perturbed and weakly interacting Beltrami flows. If time permits, I will discuss the relevance of such constructions to the famous Onsager conjecture in 3d turbulence.