Geometric isometries and the Baire category

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During the last decade there was a huge variety of paper considering the construction of lipschitz isometries between equall dimensional spaces - the usual rigidity theorems show that C1 maps of this kind are affine and hence it seemed natural to require only that the derivative is only a.e. an isometry. Such maps are even residual among all contractions - they can however, as some geometers like to object, collaps lowerdimensional objects (e.g. curves or surfaces) into points. We will decribe a new approach, showing that even the geometric isometries (maps that preserve length of all curves, and hence all kind of volumina) are residual in the category sense. This is joint work with E. Spadaro and L.Szekelyhidi

Weak and measure-valued solutions of the incompressible Euler equations

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In a seminal paper of 1987, R. DiPerna and A. Majda introduced the notion of measure-valued solution for the incompressible Euler equations in order to capture complex phenomena present in limits of approximate solutions, such as persistence of oscillation and development of concentrations. Furthermore, they gave several explicit examples exhibiting such phenomena. In this talk I will present a result which shows that any measure-valued solution can be generated by a sequence of weak solutions. In particular this gives rise to a very large, arguably too large, set of weak solutions of the incompressible Euler equations. This is joint work with Lszl Szkelyhidi Jr.