An infinite hierarchy of guage particle solutions to a regularized Euler equation: numerical methods and beyond[1] HENRY JACOBS, COLIN COTTER, DARRYL HOLM, Imperial College, DAVID MEIER, Brunel University — In this talk we present an infinite hierarchy of exact solutions to a regularized form of Euler's fluid equations. Each of these solutions is isomorphic to the motion of finitely many guage-theoretic particles, wherein each particle stores internal Lie group structures which correspond to higher-order deformation gradients of the Lagrangian flow map. Collision experiments suggest that two particles at one level in the hierarchy can asymptotically merge into a single particle at a higher-level in the hierarchy. We will display some of these collisions and provide a formal argument to explain this phenomena. These collision events are interpreted as a cascade to smaller scales.

Henry Jacobs
Imperial College