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*Hyperbolic conservation laws on manifolds: well-posedness theory and numerical approximation*

Kruzkov's theory of discontinuous solutions to nonlinear hyperbolic conservation laws in several space dimensions is restricted to the (flat) Euclidian space. In this lecture, motivated by applications to geophysical fluid flows modeled by the shallow water equations, I will present the foundations for theoretical and numerical studies of entropy solutions to hyperbolic equations posed on a curved manifold. The aim of this research is to investigate some interplay between the manifold's geometry and the behavior of discontinuous solutions to partial differential equations.

In this lecture, I will discuss the well-posedness theory, the derivation of the $L1$ contraction property, the convergence of the finite volume schemes, the $L1$ error estimate, and the practical implementation in the case of the sphere.