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On the classification of ancient solutions to curvature flows on the sphere

An ancient solution to a curvature flow is a solution that exists backwards in time forever. In this talk, I will discuss the classification of ancient solutions to curvature flows on the sphere. I will prove that the sphere exhibits a very strong rigidity: any ancient solution of a curvature flow which satisfies a backwards in time uniform bound on mean curvature must be stationary or a family of shrinking geodesic sphere. The main tools are geometric, employing the maximum principle, a rigidity result in the sphere and an Alexandrov reflection argument. This is joint work with Paul Bryan and Julian Scheuer.