Title: Liouville type theorems for geometric flows.

Abstract: It is well known that some of the most important problems in mathematics and physics are related to the understanding on singularities. In partial differential equations, the study of singularities usually involves a blow up procedure which uses the scaling properties of the equation. In the case of a parabolic equation the blow up limits are special solutions which are defined for all time $-\infty < t \leq T$ for some $T \leq +\infty$. We refer to them as ancient if $T < +\infty$ and eternal if $T = +\infty$. The classification of such solutions plays a crucial role in the singularity analysis. In some flows it is also important for performing surgery near a singularity.

In this talk we will discuss classification results for ancient solutions to geometric flows, such as the heat equation on complete manifolds, the Mean curvature flow, the Ricci flow and the Yamabe flow. We will also show how parabolic gluing methods can be used to construct new ancient solutions.