1116-35-712 **Panagiota Daskalopoulos*** (pdaskalo@math.columbia.edu), Department of Mathematics, Columbia University, 2990 Broadway, New York, NY 10027. *Ancient solutions to parabolic partial differential equations.*

Some of the most important problems in geometric partial differential equations are related to the understanding of *singularities*. This usually happens through a *blow up* procedure near the potential singularity which uses the scaling properties of the equation. In the case of a *parabolic* equation the blow up analysis often leads to 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, when possible, often sheds new insight to the singularity analysis.

We will give a survey of recent research progress on *ancient* solutions to *geometric flows* such as the Ricci flow, the Mean Curvature flow and the Yamabe flow. Our discussion will also include other models of nonlinear parabolic partial differential equations.

We will address both *Liouville* type results for the classication of ancient or eternal solutions to parabolic equations as well as the construction of new ancient solutions from the *gluing* of two or more *solitons*. (Received September 10, 2015)