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The Ricci flow and Bartnik's quasi-local mass

Consider a Riemannian manifold M with an asymptotic end and a compact (i.e., inner) boundary. On this boundary, fix the boundary metric and mean curvature. Bartnik's "static minimization conjecture" is that, of all asymptotically flat Riemannian metrics on M with

(i) nonnegative scalar curvature,

(ii) containing no minimal hyperspheres, and

(iii) inducing the given metric and mean curvature on the boundary,

there will be a metric which minimizes the ADM mass of M, and that this metric obeys the static Einstein equations on M. B. List in his PhD thesis described a geometric flow, now recognized to be a certain Ricci flow, which leads to an approach to this problem. I will describe a study of List's flow in the rotationally symmetric case.

This is joint work with T. Oliynyk and L. Gulceva.