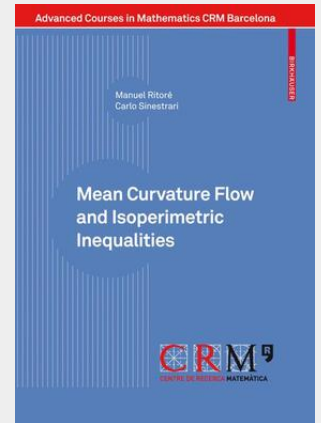


Mean Curvature Flow and Isoperimetric Inequalities

Geometric flows have many applications in physics and geometry. The mean curvature flow occurs in the description of the interface evolution in certain physical models. This is related to the property that such a flow is the gradient flow of the area functional and therefore appears naturally in problems where a surface energy is minimized. The mean curvature flow also has many geometric applications, in analogy with the Ricci flow of metrics on abstract riemannian manifolds. One can use this flow as a tool to obtain classification results for surfaces satisfying certain curvature conditions, as well as to construct minimal surfaces. Geometric flows, obtained from solutions of geometric parabolic equations, can be considered as an alternative tool to prove isoperimetric inequalities. On the other hand, isoperimetric inequalities can help in treating several aspects of convergence of these flows. Isoperimetric inequalities have many applications in other fields of geometry, like hyperbolic manifolds.



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