

Isoperimetric Inequalities in Mathematical Physics

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A typical Isoperimetric Problem is to enclose a given area A with a shortest possible curve. The classical Isoperimetric Theorem asserts that in the Euclidean plane the unique solution is a circle. There are many other results of a similar nature, referred to as Isoperimetric Inequalities of Mathematical Physics or sometimes as Shape Optimization Problems, where extrema are sought for various quantities of physical significance such as the energy functional or the eigenvalues of a differential equation. They are shown to be extremal for a circular or spherical domain. I will be talking about such Shape Optimization Problems.