

The isoperimetric problem in \mathbb{R}^n with density

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I will present some recent results on the isoperimetric problem with density, that is the problem of characterizing sets which minimize a weighted perimeter functional under a weighted volume constraint. In the first part of the talk, I will focus on the case of a general density function and study boundedness and regularity properties of isoperimetric sets under very weak assumption on the regularity of the density. These results are obtained in collaboration with A. Pratelli. In the second part of the talk, I will consider more specific densities (which satisfy some concavity conditions) and show a quantitative version of the already known isoperimetric inequality (proven by X. Cabré, X. Ros and J. Serra). The proof is based on the Alexandrov Bakelman Pucci method applied to an appropriate linear Neumann problem. This last result is contained in a joint work with X. Cabré, A. Pratelli, X. Ros and J. Serra.