

Symmetry problems in geometric analysis

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24 hours

Abstract

The course will focus on some rigidity results for closed hypersurfaces with prescribed curvatures, starting from the connections with symmetry properties for solutions of partial differential equations of elliptic type. In particular two classical approaches will be discussed: the moving planes technique and an integral method based on sharp inequalities.

Program

- Classical inequalities: convex functions, matrices, and perimeters.
- Interior and boundary maximum principles for elliptic operators.
- Serrin's overdetermined problem (part I): moving planes.
- Serrin's overdetermined problem (part II): Weinberger's P-function.
- Hypersurfaces: the Second Fundamental Form and the Mean Curvature.
- Minkowski formulas and Jellett's theorem.
- Aleksandrov's theorem (part I): moving planes.
- Aleksandrov's theorem (part II): Reilly's integral approach.