Dr Andrea SEPPI
Institut Fourier – Université Grenoble Alpes (France)

Flexibility and rigidity of hypersurfaces in Minkowski space under curvature constraints

A classical theorem of A.D.Alexandrov states that the only closed embedded smooth hypersurfaces of constant mean curvature in Euclidean n-space are spheres. Also, an analogous statement holds when replacing mean curvature by Gaussian curvature.

In contrast with these rigidity results, much more flexibility is encountered in the Lorentzian counterpart of Euclidean space, Minkowski space, which is also the natural framework for Special Relativity. For instance there is an abundance of non-trivial deformations of the standard embedding of the hyperbolic plane into Minkowski space of dimension three, having constant mean or Gaussian curvature.

In this talk we will explore these flexibility phenomena, survey several recent and not-so-recent results towards a complete classification, and present the relations of these problems with other areas such as Monge-Ampère equations, harmonic mappings of Riemannian manifolds, and Teichmüller theory.