

Surfaces with prescribed Gaussian images and applications to anisotropic minimal surfaces

Antonio De Rosa

Bocconi University

We construct d -dimensional polyhedral chains in $\mathbb{R}^n$ filling the boundary of a unit d -cube and with distribution of tangent planes that is arbitrarily close to a prescribed measure on the Grassmannian having as barycenter a simple d -vector. If the measure on the Grassmannian is supported on the set of positively oriented d -planes, we can achieve these fillings as Lipschitz multigraphs. We apply this construction to prove that, for anisotropic integrands, the classical polyconvexity is equivalent to quasiconvexity with respect to multi-valued Lipschitz maps, and to show that strict polyconvexity is necessary for the atomic condition to hold. Joint work with Y. Lei and R. Young.

In Special Session 3 on Geometric Variational Problems in Smooth and Nonsmooth Metric Spaces at the Mathematical Congress of the Americas 2025.