"La matemática es el trabajo del espíritu humano
que está destinado tanto a estudiar como a conocer,
tanto a buscar la verdad como a encontrarla."

—Évariste Galois

Universidad de Granada

Jornada de Geometría

Grupo de investigación
Problemas variacionales en geometría

Plan de Formación Específica
Programa de Doctorado en Matemáticas

15–16 de diciembre de 2011
Sala de Juntas
Facultad de Ciencias.

Programa

Todas las conferencias tendrán lugar en el Sala de Juntas, situada en la vestíbulo de la Facultad de Ciencias.

JUEVES 15

17:00 Francisco Martín (Universidad de Granada)

Properly embedded area minimizing surfaces in hyperbolic three space

18:00 Bárbara Nelli (Università di L'Aquila)

Minimal surfaces with two ends in $\mathbb{H}^2 \times \mathbb{R}$

VIERNES 16

10:00 Sébastien Cartier (Université Paris-Est Créteil Val-de-Marne)

Deformations of CMC-$1/2$ *entire graphs and annuli in* $\mathbb{H}^2 \times \mathbb{R}$

11:00 Café.

11:30 José A. Gálvez (Universidad de Granada)

Barriers for the existence and non existence of surfaces with constant curvatures in $M^2 \times \mathbb{R}$

11:30 Alessandro Savo (Università di Roma)

Spectrum and involutions

14:00 Comida.

Resúmenes

Properly embedded area minimizing surfaces in hyperbolic three space

Francisco Martín

We prove that, given S an open oriented surface, then there exists a complete, proper, area minimizing embedding $f : S \to \mathbb{H}^3$. The main tool in the proof of the above result is a sort of *bridge principle at infinity* for properly embedded area minimizing surfaces in hyperbolic three space. This is a joint work with Brian White.

Minimal surfaces with two ends in $\mathbb{H}^2 \times \mathbb{R}$

Bárbara Nelli

How the shape of the ends of a minimal surface determines the surface itself? We discuss the problem for minimal surfaces with two ends in $\mathbb{H}^2 \times \mathbb{R}$. Namely, we prove a Schoen type theorem for such surfaces.

Deformations of CMC-$1/2$ entire graphs and annuli in $\mathbb{H}^2 \times \mathbb{R}$

Sébastien Cartier

We study regular deformations of constant mean curvature (CMC) $1/2$ surfaces with vertical ends in $\mathbb{H}^2 \times \mathbb{R}$ using a suitable extension of the mean curvature operator at infinity. The two main results are the following:

- we show that the moduli space of CMC-$1/2$ entire graphs with vertical end can be endowed with a strucutre of infinite dimensional smooth manifold based on $\mathscr{C}^{2,\alpha} \times \mathbb{R}$;
- we can deform CMC-$1/2$ rotational annuli so that the ends of the resulting annuli are still asymptotically rotational but no longer with the same axis.

Barriers for the existence and non existence of surfaces with constant curvatures in $M^2 \times \mathbb{R}$

José A. Gálvez

We present a deformation of surfaces from a product space $M_1 \times R$ into another product space $M_2 \times \mathbb{R}$ such that the relation of the principal curvatures of the deformed surfaces can be controlled in terms of the curvatures of M_1 and M_2. Thus, starting from a known example, we obtain subsolutions for the existence or barriers for the non existence of surfaces with fixed mean curvature, extrinsic curvature or Gaussian curvature in $M \times \mathbb{R}$.

Spectrum and involutions

Alessandro Savo

This is a joint work with Bruno Colbois. Consider a compact Riemannian manifold M with an involutive isometry γ, and assume that the distance of any point to its image under γ is bounded below by a positive constant β (the smallest displacement). We observe that this simple geometric situation has a strong consequences on the spectrum of a large class of γ-invariant operators D (including the Schrödinger operator acting on functions and the Hodge Laplacian acting on forms): roughly speaking, the gap $\lambda_2(D) - \lambda_1(D)$ between the first and the second eigenvalue of D is uniformly bounded above by a constant depending only on the displacement β (in particular, not depending on D).