Benoît Daniel

On parallel mean curvature surfaces in product manifolds

In this talk we will classify parallel mean curvature surfaces with constant intrinsic curvature in the product manifolds S^2 x S^2 and H^2 x H^2, where S^2 is the constant curvature sphere and H^2 the hyperbolic plane. In particular this classification will provide new examples. This is a joint work with I. Domingos and F. Vitorio.

José A. Gálvez

A general Hopf-type theorem for immersed spheres in three-manifolds.

Given a class of surfaces modeled by an elliptic PDE in an arbitrary three-manifold that admits candidate surfaces, we determine the uniqueness of the immersed spheres in this class. This generalizes many known uniqueness results as Hopf theorem, Liebmann theorem or Abresch-Rosenberg theorem among others, and leads to new results. (Joint work with P. Mira)

José N. V. Gomes

Estimates of eigenvalues of an elliptic differential system in divergence form

In this talk, we will show an interesting case of rigidity inequalities of the eigenvalues of the Laplacian, more precisely, we will consider a countable family of bounded domains in Gaussian shrinking soliton that makes the behavior of known estimates of the eigenvalues of the Laplacian invariant by a first-order perturbation of this operator. In a different context, we will address the Gaussian expanding soliton case. This is joint work with Marcio C. Araújo Filho from Universidade Federal de Rondônia, Campus Ji-Paraná, Brazil.

Vanderson Lima

A two-piece for free-boundary minimal surfaces in the ball

In this talk, we will present the result stating that every equatorial disc divides an embedded compact free boundary minimal surface of the euclidean 3-ball in exactly two connected surfaces. Also we will discuss some applications of this result. This is a joint work with Ana Menezes (Princeton University).

Pablo Mira

The Bernstein problem for Weingarten surfaces

A surface in Euclidean 3-space is an elliptic Weingarten surface if its mean curvature H and Gaussian curvature K are related by a smooth, elliptic equation W(H,K)=0. A well known open problem, proposed for instance by Rosenberg and Sa Earp in 1994, is to solve the Bernstein problem for this class of surfaces, that is: are planes the only entire elliptic Weingarten graphs? Up to now, it is only known that the answer is positive if the Weingarten equation is uniformly elliptic; this follows from a deep theorem by L. Simon on entire graphs with quasiconformal Gauss map. In this talk we present two theorems. In the first one, we extend the solution to the Bernstein problem in the uniformly elliptic case to multigraphs, proving that planes are the only complete uniformly elliptic Weingarten surfaces whose Gauss map image lies in an open hemisphere. In the second one, we will solve in the affirmative the Bernstein problem for Weingarten graphs for a large class of non-uniformly elliptic Weingarten equations. This is a joint work with Isabel Fernández and José A. Gálvez.

Barbara Nelli

Hypersurfaces with constant higher order mean curvature

We give an overview of some old and new results about the shape of hypersurfaces whose one of the symmetric functions of the principal curvature is constant.

Michele Rimoldi

The Frankel property for self-shrinkers from the viewpoint of elliptic PDE's

In many instances, properly immersed self-shrinkers of the MCF behave like closed minimal hypersurfaces of the standard sphere. In this latter setting, it is well known that any two closed minimal immersed hypersurfaces must intersect. Actually the ambient space can be generalized to a compact Riemannian manifold with strictly positive Ricci curvature. This is called the Frankel property after the celebrated paper by T. Frankel. Starting from the work by G. Wei and W. Wylie, where the case of compact hypersurfaces is considered, we investigate, by taking the purely elliptic viewpoint, the validity of the (smooth) properly embedded Frankel property for self-shrinkers. In particular, we prove that two properly embedded self-shrinkers in the Euclidean space that are sufficiently separated at infinity must intersect at a finite point. The proof is based on a localized version of the Reilly formula applied to a suitable f-harmonic function with controlled gradient. Moreover, in the immersed case, we will show how tools from potential theory of weighted manifolds permit to prove half-space type properties for self-shrinkers. This is a joint work with D. Impera and S. Pigola.

João P. dos Santos

Einstein Hypersurfaces of Sn×R and Hn×R

In this talk, we classify the Einstein hypersurfaces of Sn×R and Hn×R. We use the characterization of the hypersurfaces of Sn×R and Hn×R whose tangent component of the unit vector field spanning the factor R is a principal direction and the theory of isoparametric hypersurfaces of space forms to show that Einstein hypersurfaces of Sn×R and Hn×R must have constant sectional curvature. This is a joint work with Benedito Leandro (UFG) and Romildo Pina (UFG).

Hung Tran

On the Morse Index with Constraints

Consider a geometric functional such as the area or the volume. In order to find local extrema, we calculate the second variation which is normally a symmetric bilinear form in a function space. The Morse index, which counts the maximal dimension of a subspace on which the form is negative definite, is the generalization of the 2nd derivative test in elementary calculus. Now consider the natural extension of finding extrema subject to certain constraints. How would we examine the index with constraints? In this talk, we'll answer that question in a general abstract framework and then apply it to study capillary surfaces. This is joint work with Detang Zhou.