



Mês de: **Março 2011**

SEMINÁRIO DE GEOMETRIA

Dia 22 de Março (terça-feira), às 18h20, na Sala B3-01

“From Catenoid-Helicoid deformation to geometry of loop groups”

(joined work with A.L. Mare, P. Quast)

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Abstract:

Minimal surfaces in euclidean 3-space allow for an associated family of isometric deformations, parametrized along a circle, where the principal curvatures and the tangent planes are preserved (parallel translated) while the principal curvature directions are rotated. The most common example is the deformation of the catenoid into the helicoid which returns back to the catenoid turned inside out. The existence of such an associated family of deformations is characteristic for minimal surfaces and more generally for harmonic maps of surfaces.

This remains true if euclidean space is replaced with a Riemannian symmetric space where euclidean parallel translations are replaced with transvections of the symmetric space. This reasoning leads in a straight forward way to the loop group theory of harmonic maps on surfaces and more generally, of pluriharmonic maps on K^{\vee} -manifolds; the loop parameter comes from the associated family. The geometry of the loop space over the transvection group, in particular the Morse theory of the energy functional on this space gives a classification of harmonic spheres and pluriharmonic maps on simply connected compact K^{\vee} -manifolds into the symmetric space. The difference between inner symmetric spaces (where the point reflections belongs to the transvection group) and outer ones is very important for this theory and will be addressed.

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