

Constant mean curvature surfaces and Harmonic maps in simply connected homogeneous 3-manifolds

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Resumo/Abstract:

This lecture is an introduction to the differential geometry of surfaces in $E(k,t)$ -spaces.

We begin by introducing the fundamental equations for immersed surfaces in $E(k,t)$ spaces, present the Daniel's sister correspondance, the classification of CMC sphere by Abresch and Rosenberg via a holomorphic quadratic differential, and a Willmore problem for sphere introduced by Berdinsky and Taimanov. We will study the theory of finite total curvature minimal surfaces in $H^2 \times R$ and the link with harmonic maps. Next we will present the work of P. Mira and I. Fernandez in the classification of minimal graphs in Nil and CMC $H=1/2$ in $H^2 \times R$. We will finish by the construction of examples and give some perspectives of unachieved classification in the theory.