

Complete surfaces with non-positive curvature in space forms

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The investigation of isometric immersions of metrics with negative curvature goes back to Hilbert. He proved in 1901 that the full hyperbolic plane cannot be isometrically immersed in R^3 , and in 1963, Efimov extended this result to complete surfaces with negative curvature uniformly separated from 0. Subsequently, several worklines were opened related to Efimov's result, namely, either to extend it to a bigger family of complete immersions in R^3 , or to obtain equivalent results for complete surfaces in non-Euclidean space forms. In this talk I will introduce some advances concerning both work-lines mentioned above:

- a. Firstly we will analyze the case when Efimov's conditions hold in a neighborhood of infinity on a complete surface immersed in Euclidean 3-space and prove the surface is topologically a finitely punctured compact surface, the area is finite and each puncture is asymptotic to rays.
- b. Finally I will give some Efimov and Milnor's type results on complete surfaces immersed in non-Euclidean space forms which satisfy that outside a compact set they have non-positive Gauss curvature and strictly separated principal curvatures.

This is a joint work with J. A. Gálvez and A. Martínez from University of Granada, Spain.