GEOMETRY SESSION

On Stability and Isoperimetry of Constant Mean Curvature Spheres of $\mathbb{H}^n \times \mathbb{R}$ and $\mathbb{S}^n \times \mathbb{R}$.

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Monday, February 5, 2024.
14h40 - 15h20

Math Department - SALA B

Abstract.

In this talk, which is based on a joint work with M. F. Elbert (UFRJ) and B. Nelli (Universitá di L'Aquila), we approach the one-parameter family of rotational constant mean curvature (CMC) spheres of $\mathbb{H}^n \times \mathbb{R}$ and $\mathbb{S}^n \times \mathbb{R}$, focusing on their stability and isoperimetry properties. Our results include the proof of the uniqueness of the regions enclosed by the rotational CMC spheres of $\mathbb{H}^n \times \mathbb{R}$ as solutions to the isoperimetric problem, which fills in a gap in the original proof given by Hsiang and Hsiang. We also establish that all CMC spheres of $\mathbb{H}^n \times \mathbb{R}$ are stable, and so are those of $\mathbb{S}^n \times \mathbb{R}$ with sufficiently large mean curvature. In addition, we show that there exists a one-parameter family of CMC spheres in $\mathbb{S}^n \times \mathbb{R}$ which are stable and non-isoperimetric (i.e., they do not bound isoperimetric regions). In presenting these results, we intend to make clear that, in essence, they come from the fact that the rotational CMC spheres of $\mathbb{H}^n \times \mathbb{R}$, and those of $\mathbb{S}^n \times \mathbb{R}$ with sufficiently large mean curvature, are nested.