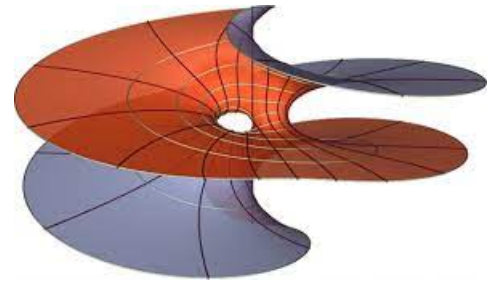


Oberseminar Geometrie
Department of Mathematics
University of Fribourg
Lecture room 2.52 Physics
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FRANCESCA TRIPALDI (UNIBE)

Studying sequences of properly embedded minimal discs

This talk centres around the study of sequences of minimal discs in a three manifold. In general, if no restriction on the curvatures of the disks is required, it is known that some wild behaviour should be expected. A first example was constructed by Colding and Minicozzi of a sequence of minimal disks in the Euclidean ball for which the curvatures blow up at the centre of the ball.

Together with L. Ruffoni, we generalised this construction of a single blow up point to an unbounded domain. On the other hand, one can also consider the study of the topology of the limit leaves of sequences of properly embedded minimal discs. Bernstein and Tinaglia first introduced the concept of the simple lift property, since leaves of a minimal lamination obtained as a limit of a sequence of properly embedded minimal disks satisfy this property. They proved that an embedded surface $\Sigma \subset \Omega$ with the simple lift property must have genus zero, if Ω is an orientable three-manifold satisfying certain geometric conditions. In particular, one key condition is that Ω cannot contain closed minimal surfaces.

During my PhD, I generalised this result by taking an arbitrary orientable three-manifold Ω and proving that one is able to restrict the topology of an arbitrary surface $\Sigma \subset \Omega$ with the simple lift property. Among other things, it was shown that the only possible compact surfaces with the simple lift property are the sphere and the torus in the orientable case, and the connected sum of up to four projective planes in the non-orientable case.