Geometry Seminar

Mean curvature flows in the sphere via phase transitions

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Time: 10:30 am

Acesso à sala virtual:

Abstract. In this talk, we will discuss some solutions of the mean curvature flow (MCF) of surfaces in the 3-sphere. We will recall a generalized notion of MCF introduced by Brakke in the 70s [1], as well as its regularization by a parabolic partial differential equation arising in the theory of phase transitions. Inspired by a recent result due to K. Choi and C. Mantoulidis [3], we will talk about some existence (and also symmetry) problems for this parabolic equation, and use them to construct MCFs that join minimal surfaces of low area in the 3-sphere.

This is joint work with Jingwen Chen (the University of Chicago).

References

[1] K. Brakke. The motion of a surface by its mean curvature. Mathematical Notes, 20. Princeton University Press, Princeton, 1978. i+252 pp.

[2] J. Chen, and P. Gaspar. Mean curvature flow and low energy solutions of the parabolic Allen-Cahn equation on the three-sphere. Preprint, available at https://arxiv.org/abs/2107.09140, 2021.

[3] K. Choi, and C. Mantoulidis. "Ancient gradient flows of elliptic functionals and Morse index" Preprint available at https://arxiv.org/abs/1902.07697, 2019. To appear in Amer. J. Math.