מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Seminar in Geometry and Topology

Room 290C ,Ziskind Building
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at 16:15

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The Mean Curvature flow and its applications

Abstract:

Being the gradient flow of the area functional, the mean curvature flow can be thought of as a greedy algorithm for simplifying embedded shapes. But how successful is this algorithm?
In this talk, I will describe three examples for how mean curvature flow, as well as its variants and weak solutions, can be used to achieve this desired simplification.

The first is a short time smoothing effect of the flow, allowing to smooth out some rough, potentially fractal initial data.

The second is an application of mean curvature flow with surgery to smooth differential topology, allowing to conclude Schoenflies-type theorems about the moduli space of smooth embedded spheres and tori, satisfying some curvature conditions.

The third is an application of (weak,modified) mean curvature flow to differential geometry, allowing to relate bounds on the gaussian entropy functional to the topology of a closed hypersurface.

In this talk, which will assume no prior knowledge in PDE or mean curvature flow, I will try to highlight the relation between the analysis of the flow and in particular, its singularity formation, to both ''time dependent'' and "classical" geometry.

Some of the results described in this talk are joint works with Reto Buzano, Robert Haslhofer and Brian White.