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*Classification of compact ancient noncollapsed flows in  $R^4$*

To capture singularities under mean curvature flow one wants to understand all ancient solutions. In addition to shrinkers and translators one also encounters ancient ovals, namely compact noncollapsed solutions that are not self-similar. In this talk, I will explain that any bubble-sheet oval for the mean curvature flow in  $R^4$ , up to scaling and rigid motion, either is the  $O(2) \times O(2)$ -symmetric ancient oval constructed by White, or belongs to the one-parameter family of  $Z_2^2 \times O(2)$ -symmetric ancient ovals constructed by Du and myself. In particular, this seems to be the first instance of a classification result for geometric flows that are neither cohomogeneity-one nor selfsimilar. This is joint work with Beomjun Choi, Toti Daskalopoulos, Wenkui Du and Natasa Sesum. I will also briefly mention the noncompact case, which is joint work with Kyeongsu Choi and Or Hershkovits.