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T Bourni* (tbourni@utk.edu), 227 Ayres Hall, 1403 CIRCLE DRIVE, Knoxville, TN 37996, and
M Langford and **G Tinaglia**. *Ancient solutions to mean curvature flow*.

Mean curvature flow (MCF) is the gradient flow of the area functional; it moves the surface in the direction of steepest decrease of area. An important motivation for the study of MCF comes from its potential geometric applications, such as classification theorems and geometric inequalities. MCF develops “singularities” (curvature blow-up), which obstruct the flow from existing for all times and therefore understanding these high curvature regions is of great interest. This is done by studying ancient solutions, solutions that have existed for all times in the past, and which model singularities. In this talk we will discuss their importance and ways of constructing and classifying such solutions. In particular, we will focus on “collapsed” solutions and construct, in all dimensions $n \geq 2$, a large family of new examples, including both symmetric and asymmetric examples, as well as many eternal examples that do not evolve by translation. Moreover, we will show that collapsed solutions decompose “backwards in time” into a canonical configuration of Grim hyperplanes which satisfies certain necessary conditions. This is joint work with Mat Langford and Giuseppe Tinaglia. (Received January 28, 2021)