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Sporadic Reinhardt polygons

A *Reinhardt polygon* is a convex n -gon that is optimal in three different geometric optimization problems: it has maximal perimeter relative to its diameter, maximal width relative to its diameter, and maximal width relative to its perimeter. Many Reinhardt polygons exhibit a particular periodic structure, and these are well understood. However, for certain values of n , such as $n = 30$ and $n = 42$, some *sporadic* Reinhardt polygons also occur. We characterize the integers n for which sporadic Reinhardt polygons with n sides exist, and investigate the number of such polygons, relative to the number of periodic ones with n sides. This is joint work with Kevin Hare.