

Abstract Submitted  
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**On Ulam's packing conjecture: is the ball the worst shape for packing?** YOAV KALLUS, Princeton University — The question of which convex shapes leave the most empty space in their densest packing is the subject of Reinhardt's conjecture in two dimensions and Ulam's conjecture in three dimensions. In two dimensions, a regular octagon whose corners have been smoothed to arcs of hyperbolas is known to be a local minimum of the optimal packing fraction and the circle is known to not be a local minimum. In three dimensions, we show that the ball is a local minimum: it is the worst packing shape among shapes of sufficiently low asphericity. We also discuss related results in higher dimensions and for the worst shape for other optimal arrangement problems.

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