

Abstract Submitted
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Packing of Tetrahedral and other Dice PAUL CHAIKIN, Physics, NYU, STACY WANG, Stuyvesant H. S., ALEXANDER JAOSHVILI, Physics, NYU — The densest packing of tetrahedra remains an unsolved problem. Recently J. H. Conway, and S. Torquato¹, presented the densest packing yet found for tetrahedral, a structure which is a modification of packing tetrahedra in an approximation to an icosahedron and then packing the icosahedra. The best packing was under 0.72, considerably less than the (exact) densest sphere packing of 0.7405... We have measured the random packing of tetrahedral dice in different sized spherical and cylindrical containers, and extrapolated the results to obtain the packing fraction in the limit of no boundaries. We have also measured their density toward the center of a spherical container away from the walls. Both measurements are similar to previous studies of ellipsoids. We find that the dice pack to better than 0.75. But the dice have very slightly rounded vertices and edges. While the total volume change due to the rounding is less than 0.03 (and in the direction to make a larger difference between crystal and random packing), it is difficult to approximate the effect of the rounding. We discuss the relative packings and the nature of the inter-die contacts. 1. J. H. Conway, and S. Torquato, PNAS, **103**, 10612-10617, (2006)

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