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Stephanie Vance* (s1vance@adams.edu), School of Sciences, Adams State College, 208 Edgemont Boulevard, Alamosa, CO 81102. *Improved sphere packing lower bounds from Hurwitz lattices.*

In this talk a new asymptotic lower bound will be given for the sphere packing density in dimensions divisible by four. This asymptotic lower bound improves on previous asymptotic bounds by a factor of $3/e$ and improves not just lower bounds for the sphere packing density, but also for the lattice sphere packing density and in fact, the Hurwitz lattice sphere packing density. Note that a Hurwitz lattice is a lattice in a quaternionic vector space which is closed under scalar multiplication by the Hurwitz integers $\mathbb{Z}[i, j, \frac{1+i+j+k}{2}]$. Moreover, the lattice sphere packing density for dimension n is directly proportional to the $(n/2)^{\text{th}}$ power of Hermite's constant γ_n , i.e., the supremum of the Hermite invariant computed over all n -dimensional lattices. (Received September 14, 2010)