

THE KEPLER CONJECTURE

Thomas C. Hales

Department of mathematics, University of Michigan, East Hall
525 East University Avenue, Ann Arbor MI 48109-1109, USA.

Johannes Kepler originated the mathematical theory of the genesis of inorganic form. Anticipating modern theories of the atom in an essay published in 1611, he explored a theory of matter composed of small spherical particles.

His essay describes the face-centered cubic packing -- the familiar cannonball arrangement of spheres -- and asserted that --the packing will be the tightest possible, so that in no other container could more pellets be stuffed into the same container." This assertion has come to be Known as the Kepler conjecture.

Kepler's assertion has such intuitive force that no one who has >contemplated packings has cast any doubt on its veracity. And yet over the intervening centuries, mathematicians have tried in vain to give a rigorous mathematical proof of this claim. The situation has been >described as scandalous. The conjecture stands as the oldest problem in discrete geometry. The status of this problem has changed significantly over the past few months.