1077-11-2610   **Susan Hammond Marshall*** (`smarshal@monmouth.edu`) and **Alexander R. Perlis**. *Integer Embeddings of Heronian Tetrahedra.*

A triangle is said to be Heronian if all three of its sides have integer length and its area is also an integer. It was proved in 2001 that every Heronian triangle has an integer embedding in the plane. In this talk, we will prove the 3-dimensional analogue: every Heronian tetrahedron has an integer embedding in $\mathbb{R}^3$, where a tetrahedron is said to be Heronian if all of its edges have integer length, all of the triangles making up its faces have integer area and its volume is an integer. This result is a corollary of the following more general result, which we prove using the arithmetic of quaternions: Let $M \subset \mathbf{Q}^3$ be a finite set of points such that the distance between any two points is an integer. Then there exists a Euclidean motion T so that $TM \subset \mathbb{Z}^3$. (Received September 22, 2011)