1077-11-2325 **Sarah Peluse*** (peluse@uchicago.edu), **Krishna Dasaratha**, **Laure Flapan**, **Tom Garrity**, **Chansoo Lee**, **Cornelia Mihaila**, **Nicholas Neumann-Chun** and **Matt Stoffregen**. *A Family of Algorithms Yielding a Solution to the Hermite Problem.* Preliminary report.

It's well-known that a real number's continued fraction expansion is eventually periodic if and only if it is a quadratic irrational. In 1848, Charles Hermite asked Carl Jacobi for a way to represent real numbers as sequences of non-negative integers such that a number's algebraic properties are revealed by the periodicity of its sequence. Specifically, Hermite wanted an algorithm that returns an eventually periodic sequence of integers if and only if its input is a cubic irrational. Many algorithms, known as multidimensional continued fractions, have been proposed since then, including the Jacobi-Perron algorithm, the Mönkemeyer algorithm, and the Güting algorithm. Many of these algorithms have the property that an eventually periodic sequence implies cubic irrationality, but none have been proven to have the converse property. Building on the triangle map, we have combined three different multidimensional continued fractions to create a family of algorithms that solve the Hermite problem. (Received September 22, 2011)