1086-11-1426 **Krishna Dasaratha**, **Laure Flapan**, **Thomas Garrity*** (`tgarrity@williams.edu`), **Chansoo Lee**, **Cornelia Mihaila**, **Nicholas Neumann-Chu**, **Sarah Peluse** and **Matthew Stroffregen**.
Cubic Irrationals and Periodicity via a Family of Multi-dimensional Continued Fraction Algorithms.

It has long been unknown if there is an algorithm to represent any real number by a sequence of integers such that the sequence is eventually periodic if and only if the real number is a cubic irrational. This is the Hermit problem. We construct a countable family of multi-dimensional continued fraction algorithms, built out of five specific multidimensional continued fractions, and show that a real number is a cubic irrational precisely when its multidimensional continued fraction expansion with respect to at least one element of the countable family is eventually periodic. We interpret this result as the construction of a matrix with entries of non-negative integers such that at least one of the rows is eventually periodic if and only if the initial real is a cubic irrational. (Received September 21, 2012)