

1067-11-1907

**Thomas Garrity\***, Department of Mathematics and Statistics, Williams, Williamstown, MA 01267. *Generalizing Stern's Diatomic Sequences via Multi-dimensional Continued Fractions*. Preliminary report.

Continued fractions are linked to Stern's diatomic sequence  $0, 1, 1, 2, 1, 3, 2, 3, 1, 4, \dots$  (given by the recursion relation  $a_{2n} = a_n$  and  $a_{2n+1} = a_n + a_{n+1}$ , where  $a_0 = 0$  and  $a_1 = 1$ ). Using a particular multi-dimensional continued fraction algorithm (the Farey algorithm), we will generalize the diatomic sequence to a collection of numbers that quite naturally should be called the tri-atomic sequence (or a two-dimensional Pascal with memory sequence). As continued fractions and the diatomic sequence can be thought of as coming from systematic subdivisions of the unit interval, this new tri-atomic sequence will arise by a systematic subdivision of a triangle. We will discuss some of the algebraic properties for the tri-atomic sequence. (Received September 22, 2010)