

1079-05-410

**Jorge Bruno** (rockhardar@gmail.com), Galway, Ireland, and **Edwin O’Shea\***  
(osheaem@jmu.edu), Harrisonburg, VA 22807. *Relaxed r-complete partitions: an error-correcting  
Bachet’s problem.*

Long misnomered as Bachet’s problem, a problem of Fibonacci asks: “What is the least number of pound weights that can be used on a scale pan to weigh any integral number of pounds from 1 to 40 inclusive, if the weights can be placed in either of the scale pans?” Motivated by a natural error-correcting generalization of this problem, we define, classify and enumerate *relaxed r-complete partitions*. We show that these partitions enjoy a succinct description in terms of lattice points in polyhedra, with allowances in the error being commensurate with translations in the defining hyperplanes. The enumeration of the minimal such partitions (those with fewest possible parts) can be achieved by Brion’s formula for encoding lattice points in polyhedra. This work generalizes that of Rødseth on enumerating minimal r-complete partitions. (Received January 18, 2012)