1106-11-1748 **Brandt Kronholm*** (kronholm@risc.jku.at), Research Institute for Symbolic Computation, Johannes Kepler University, Altenberger Straße 69, A-4040 Linz, Austria, and **Felix Breuer** and **Dennis Eichhorn**. *A Supercrank for $P(n,3)$ modulo Primes of the form $6j-1$.*

In 1944, Dyson called for *direct* proofs of Ramanujan's congruences for $p(n)$ that give concrete demonstrations of how the associated partitions can be systematically divided into equinumerous classes. He conjectured that a very simple statistic on partitions, called the "rank" of a partition, performs this division when considered modulo 5 and 7. In the same paper, Dyson hypothesized the existence of a different statistic, called the "crank," that would witness Ramanujan's congruence modulo 11 in the same way.

Recent results show that Dyson's ideas can be applied to partitions of n into exactly d parts, denoted by $P(n,d)$. Moreover, some of these new cranks for $P(n,d)$ have a very surprising quality that is not shared with those for $p(n)$; there are cranks for $P(n,d)$ that witness *each and every* instance of divisibility modulo a given prime. We call these cranks *supercranks.*

In this talk, we make use of Ehrhart Geometry and other techniques to prove the following result:

Theorem (Breuer, Eichhorn, Kronholm)**.** *Largest part minus smallest part is a supercrank for $P(n,3)$ (mod m) where m is any prime of the form $6j-1$.* (Received September 15, 2014)