1078-11-42 **David Michael Zureick-Brown*** (david.zureick.brown@gmail.com), 400 Dowman Dr., W430, Atlanta, GA 30322, and **Bryden Cais** and **Jordan Ellenberg**. *Random Dieudonne modules and the Cohen-Lenstra conjectures.*

Knowledge of the distribution of class groups is elusive - it is not even known if there are infinitely many number fields with trivial class group. Cohen and Lenstra's heuristic models the p-part of a class group by a random finite abelian p-group, correctly predicting many strange experimental observations.

While proof of the Cohen-Lenstra conjectures remains inaccessible, the function field analogue – distribution of class groups of quadratic extensions of Fp(t) – is more tractable. Friedman and Washington modeled the l-power part (with l not p) of such class groups as random matrices and derived heuristics which agree with experiment. Achter later refined these heuristics, and many cases have been proved (Achter, Ellenberg and Venkatesh).

When l = p, the l-power torsion of abelian varieties, and thus the random matrix model, goes haywire. I will explain the correct linear algebraic model – Dieudoneé modules. Our main result is an analogue of the Cohen-Lenstra/Friedman-Washington heuristics – a theorem about the distributions of class numbers of Dieudoneé modules (and other invariants particular to l = p). Finally, I'll present experimental evidence supporting our heuristics. (Received November 07, 2011)