962-14-985 **Frank D. Calegari*** (fcale@math.berkeley.edu), Department of Mathematics, University of California, 1075 Evans Hall, Berkeley, CA 94720-3840. *Mysterious formulae involving the numbers of points in some families of elliptic curves.*

In this talk I will present a solution to a problem posed by N. Katz at the 2000 AWS. Let $p > 3$ be prime. Consider elliptic curves $E : y^2 = 4x^3 - g_2 x - g_3$ over $\mathbf{F}_p$ with discriminant $g_2^3 - 27g_3^2 = 1$. Sum the Hasse invariants of these (finitely many) curves, and call the answer $B(p)$. If $p \equiv 3 \bmod 4$, then $B(p) = 0$. If $p \equiv 1 \bmod 4$, and if we write p as the sum of two squares $a^2 + b^2$ with b odd, then:

$$B(p) = 2(4b^2 - a^2)$$

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