

BOSTON UNIVERSITY NUMBER THEORY SEMINAR

# Ranks of quadratic twists of quotients of modular Jacobians

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Monday, March 26 at 4:15 pm  
111 Cummington Mall, MCS B21  
Tea and cookies in MCS 144 at 4:00 pm

**Abstract:** Let  $p$  be a prime congruent to 10 or 19 mod 27, and  $J$  the Jacobian of the modular curve  $X_0(p)$ . Then there is a quotient  $A$  of  $J_0(p)$  with a rational point  $P$  of order 3. I'll sketch the proof of the following facts: the average ( $O$ -module) rank of the quadratic twists of  $A$  is at most  $7/6$ , and at least 25% of twists have rank 0. I'll also say something about non-triviality of Tate-Shafarevich groups. The proof makes crucial use of the rich arithmetic of Eisenstein quotients to compute the average size of certain 3-isogeny Selmer groups.