1079-11-395 **Emma Previato*** (ep@bu.edu), Boston University, Department of Mathematics and Statistics, Boston, MA 02215-2411. *Modular Jacobians over finite fields.*

In the theoretical and computational vein of the work of D. Maisner and E. Nart (joined by E.W. Howe and C. Ritzenthaler on follow-ups), who provide thorough information on splittability of Jacobians of curves of genus two over finite fields, we analyze the genus-two Jacobians of modular curves $X_0(N)$ to detect further properties, and begin a program of determining splittability of the Jacobians of $X_0(N)$ in genus three. Side issues that we address include the automorphism group of the curve, and the p-rank, where p is the characteristic of the field. These issues have applications to cryptography: one technique that has recently appeared in the literature is the Richelot isogeny, a generalization of Gauss's Arithmetic-geometric Mean; however, a practical implementation requires the elliptic curve to be supersingular. We propose to explore it using the characteristic zero counterpart where Richelot isogenies were recently implemented in the theory of the Kowalevski top (D. Markushevich). This is a joint project with E. Ozman. (Received January 18, 2012)