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**Kenneth A. Ribet\*** ([ribet@berkeley.edu](mailto:ribet@berkeley.edu)). *Kernels of Eisenstein ideals.*

We present joint work with Hwajong Yoo on the structure of  $J[m]$  where  $J$  is the Jacobian of the modular curve  $X_0(N)$  and  $m$  is an “Eisenstein prime,” i.e., a maximal ideal of the full Hecke ring associated to  $J$  for which the corresponding two-dimensional Galois representation is reducible.

We concentrate on the case where  $N$  is square free. The situation where  $N$  is prime was analyzed by B. Mazur in 1977; he proved, in particular, that  $J[m]$  is 2-dimensional. When  $N$  is no longer prime (but still square free), the dimension of  $J[m]$  can be computed in most cases and can be predicted conjecturally in many remaining cases. It is striking that the dimension of  $J[m]$  is no longer necessarily 2. (Received September 20, 2015)