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**Jeremy Rouse\***, rouseja@wfu.edu, and **David Zureick-Brown**. *Elliptic curves over  $\mathbb{Q}$  and 2-adic images of Galois.*

We give a classification of all possible 2-adic images of Galois representations associated to elliptic curves over  $\mathbb{Q}$ . To this end, we compute the 'arithmetically maximal' tower of 2-power level modular curves, develop techniques to compute their equations, and classify the rational points on these curves. (Received July 26, 2014)