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**Alexander J. Barrios\*** (abarrios@carleton.edu), Carleton College, Department of Mathematics and Statistics, One North College St, Northfield, MN 55057. *Explicit Classification of Isogeny Classes of Rational Elliptic Curves.*

Let  $E$  be a rational elliptic curve and let  $\mathcal{I}_E$  be the isogeny class of  $E$ . Nitaj explicitly calculated  $\mathcal{I}_E$  for an elliptic curve  $E$  with torsion subgroup isomorphic to  $\mathbb{Z}/9\mathbb{Z}$ ,  $\mathbb{Z}/10\mathbb{Z}$ ,  $\mathbb{Z}/12\mathbb{Z}$ , or  $\mathbb{Z}/2\mathbb{Z} \times \mathbb{Z}/8\mathbb{Z}$ . In this talk, we extend Nitaj's work by explicitly computing  $\mathcal{I}_E$  for an elliptic curve  $E$  with a non-trivial cyclic isogeny defined over  $\mathbb{Q}$ . In particular, we explicitly find all possible isogeny graphs over  $\mathbb{Q}$  and provide an explicit Weierstrass model for each vertex in the graph. (Received September 17, 2019)