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**Michelle A Manes\*** ([mmanes@math.brown.edu](mailto:mmanes@math.brown.edu)), Mathematics Department, Box 1917, Brown University, Providence, RI 02912. *Moduli spaces related to iteration of rational maps of  $\mathbb{P}^1$ .*

Let  $M_d(N)$  represent the moduli space of rational maps  $\phi : \mathbb{P}^1 \rightarrow \mathbb{P}^1$  of degree  $d$  together with a point of primitive period  $N$ . In this talk, I will outline a proof that the moduli space  $M(N, \mu_m)$  classifying rational maps with a non-trivial  $\mathrm{PGL}_2$  automorphism of order  $m$  is reducible for infinitely many  $N$ . (It is known that for general monic polynomials over a field  $K$ , the corresponding moduli spaces are irreducible for every  $N$ , so this result is somewhat surprising.) I will also describe some results involving rational points on these varieties and their relation to the Morton and Silverman uniform boundedness conjecture. (Received August 23, 2006)