1163-14-604 **Rohini Ramadas*** (rohini_ramadas@brown.edu) and **Rob Silversmith**. *Quadratic rational maps with a five-periodic critical point.*

We study the moduli space $\mathrm{Per}_5^{\mathrm{cm}}(0)$ of degree-2 rational maps $\mathbb{P}^1 \to \mathbb{P}^1$ that have a marked 5-periodic critical point. We show that $\mathrm{Per}_5^{\mathrm{cm}}(0)$ is an elliptic curve $\mathcal{C}_5$ punctured at 10 points, and we identify the isomorphism class of $\mathcal{C}_5$ over $\mathbb{Q}$. In order to do so, we develop techniques for using compactifications of Hurwitz spaces to study subvarieties of the moduli space of degree-d rational maps defined by critical orbit relations. We carry out an experimental study of the interaction between dynamically defined points of $\mathrm{Per}_5^{\mathrm{cm}}(0)$ (such as PCF points or punctures) and the group structure of $\mathcal{C}_5$. (Received September 10, 2020)