Philadelphia Area Number Theory Seminar

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Serre curves relative to obstruction modulo 2

Abstract: Let E be an elliptic curve de ned over Q. Fix an algebraic closure $\overline{Q}$ of Q. We get a Galois representation

$$_E : \mathrm{Gal}(\overline{Q}/Q) \; ! \; \mathrm{GL}_2(\hat{Z})$$

associated to E by choosing compatible bases for the N-torsion subgroups of $E(\overline{Q})$. In this talk, I will discuss my recent work joint with Jacob Mayle where we consider elliptic curves E de ned over Q for which the image of the adelic Galois representation $_E$ is as large as possible given a constraint on the image modulo 2. For such curves, we give a characterization in terms of their `-adic images, compute all examples of conductor at most 500,000, precisely describe the image of $_E$, and o er an application to the cyclicity problem. In this way, we generalize some foundational results on Serre curves.

Wednesday, January 25, 2023
2:00{4:00 PM

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Informal refreshments at 2:00PM { Talk at 2:30PM