

Hearing algebraic curves and factoring polynomials

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The possibility of telling apart algebraic curves over a finite field by their zeta function is a problem analogous to the classical question of hearing the shape of a drum. Just like drums, this is not always possible but often is. We discuss this problem and approaches to telling algebraic curves apart by looking at zeta functions of their étale covers. This problem has a surprising connection with the question of factoring polynomials over finite fields in deterministic polynomial time. We will also discuss this connection and a conjectural resolution.