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*An effective version of Chebotarev's density theorem*

Chebotarev's density theorem asserts that the prime ideals are equidistributed among the conjugacy classes of the Galois group of any normal extension of number fields. An effective version of this theorem was first established by Lagarias and Odlyzko in 1977. In this talk, we present an explicit refinement of their statement that applies to all non-rational fields, with every implicit constant expressed explicitly in terms of the field invariants. Additionally, we provide a sharper bound for extensions of sufficiently small degree.

We describe the main analytic tools that lead to our results, including an explicit formula for a smoothed prime ideal counting function, zero-free regions for Dedekind zeta functions, and precise bounds for sums over the non-trivial zeros of Dedekind $\zeta$-functions. We further explain how these ingredients improve upon and differ from previous approaches in the literature.

This is joint work with Habiba Kadiri and Nathan Ng. The preprint is available on arXiv at *https://arxiv.org/abs/2508.09480*.