Lethbridge Number Theory and Combinatorics Seminar

Monday — October 22, 2018
Room: C630
Time: 12:00 to 12:50 p.m.

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The Least Prime in the Chebotarev Density Theorem

The classic theorem of Chebotarev tells us that for any Galois extension L/K of degree n the proportion of primes of K, whose Frobenius conjugacy class is a given conjugacy class of the Galois group is proportional to the size of that conjugacy class. If one interprets this as a statement that the Frobenius of a randomly chosen prime is uniformly distributed, then a natural consequence is that if we begin selecting primes at random, by the time we select roughly $n\log(n)$ primes, we should expect to encounter every conjugacy class at least once. Given that selecting the first m primes is hardly random, and there are infinitely many fields it is hardly surprising that this expectation will often not be met by simply looking at the first m unramified degree one primes.

None the less, there are many known and conjectured upper bounds, relative to the absolute discriminant of L, on the smallest prime for the Chebotarev theorem.

In this talk we will discuss several aspects of this problem, including, as time allows, some recent work on computationally verifying some of these conjectures for all fields with small discriminants and on the discovery, by way of this computational verification, of an infinitely family of fields for which the smallest prime in the Chebotarev theorem is "large".

EVERYONE IS WELCOME!

Visit the seminar web page at
http://www.cs.uleth.ca/∼nathanng/ntcoseminar/

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