Abstract: Larry Rolen: Locally harmonic Maass forms and central $L$-values

In this talk, we will discuss a relatively new modular-type object known as a locally harmonic Maass form. We will discuss recent joint work with Ehlen, Guerzhoy, and Kane with applications to the theory of $L$-functions. In particular, we find finite formulas for certain twisted central $L$-values of a family of elliptic curves in terms of finite sums over canonical binary quadratic forms. Applications to the congruent number problem will be given.

Bianca Viray: On the level of modular curves that give rise to sporadic $j$-invariants

Merel’s Uniform Boundedness Theorem states that the torsion on an elliptic curve over a number field $k$ can be bounded by a constant that depends only on the degree $[k : \mathbb{Q}]$. This theorem can be rephrased as saying that for any positive integer $d$, the infinite tower of modular curves $X_1(n)_n$ has only finitely many closed points of degree at most $d$. Work of Frey and Abramovich from around the same time combine to give an independent proof of a weaker result, that for any positive integer $d$, there are only finitely many positive integers $n$ such that $X_1(n)$ has infinitely many degree $d$ points. In this talk, we study complementary part of Merel’s theorem, that is, the points $x$ on $X_1(n)$ where there are only finitely many points of degree at most $\deg(x)$. We show that these so-called sporadic points map down to sporadic points on $X_1(d)$, where $d$ is a bounded divisor of $n$. This is joint work with A. Bourdon, O. Ejder, Y. Liu, and F. Odumodu.

Tuesday, October 23, 2018, 4:00 pm
Mathematics and Science Center: W301