Dissertation Defense

Partitions, Prime Numbers, and Moonshine

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Abstract: Abstract: We prove new number theoretic results in combinatorics, analytic number theory, and representation theory. In particular, in combinatorics we prove conjectured inequalities regarding the Andrews $spt - function$ by effectively estimating $spt(n)$ using new methods from the theory of quadratic forms. We also provide recursion relations for the coefficients of conjugacy growth series for wreath products of finitary permutation groups, which provide some measure of the algebraic complexity of these groups. In analytic number theory, we reproduce the Chebotarev density of certain subsets of prime numbers through a restricted infinite sum involving the Mobius function. Finally, we refine the theory of moonshine so that the modular forms associated to the representation theory of finite groups are in fact group isomorphism invariants. We obtain this higher width moonshine for all finite groups by employing the classical Frobenius r-characters, which we prove satisfy necessary orthogonality relations.

Tuesday, February 19, 2019, 10:00 am
Mathematics and Science Center: E408

Advisor: Ken Ono

Mathematics
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