

Algebra/Topology Seminar

EFFIE SHANI

ALMOST TRIVIAL UNITS IN GROUP RINGS

Thursday, March 13, 2025

3:00 p.m. in SS-256

ABSTRACT. We study units in group rings RG of finite abelian groups G with coefficients in rings R of algebraic integers in number fields. Let Σ be the sum of all the elements of G in the group ring RG . Units of the form ug in RG (or $ug + (\Sigma)$ in $RG/(\Sigma)$, respectively) for $u \in R^\times$ and $g \in G$ are called trivial units. Units in RG that project to trivial units in $RG/(\Sigma)$ are called almost trivial units. Higman in 1939 classified all finite groups G for which $\mathbb{Z}G$ contains only trivial units, and Herman and Li in 2005 generalized his results to coefficients in rings of algebraic integers. We characterize all finite abelian groups G and rings of algebraic integers R such that the only units of the reduced group ring $RG/(\Sigma)$ are trivial units (and so all units of the group ring RG are almost trivial units). This is joint work with Anupam Srivastav, which extends the results of Brian Rich's and my Ph.D. theses under Srivastav's supervision.