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Discrete Mathematics - Algebra Combinatorics Reading Joint Seminar

Time: Thursday, November 1, 2018, 12:30-1:30 PM
Location: 329 Derrick Hall
Title: An invariant for ordinary characters arising from modular characters
Speaker: Dr. Alex Turull, Department of Mathematics, University of Florida

Abstract:

It is standard to consider that characters of finite groups assume their values in the field $\mathbf{C}$ of complex numbers. However, for some questions, such as modular representation theory for some prime p, it is more convenient and also standard to assume that characters of finite groups assume their values in some algebraic closure of the field $\mathbf{Q}_p$ of p-adic numbers. While $\mathbf{Q}_p$ is isomorphic to a subfield of $\mathbf{C}$, there is no preferred such isomorphism. This yields that, in many cases, an irreducible character of a finite group G taking values in $\mathbf{Q}_p$, for example, may correspond to multiple irreducible complex characters, depending on the chosen isomorphism of fields.

We show that, on the other hand, the choice of Brauer characters, automatically assigns to ordinary characters enough information to assign uniquely to them an invariant usually only associated with the characters defined over finite extensions of the field $\mathbf{Q}_p$.

This has some consequences for the systematic study of the rationality properties of the ordinary characters of finite groups.

The fields of p-adic numbers are fascinating objects that are fields in characteristic 0