

COLLOQUIUM

Supercharacter Theories
Constructed Using the Degrees of
Irreducible Characters and Using
the Sizes of Conjugacy Classes.

Colloquium Speaker: Julianne Rainbolt

1-29-26

SIUC Neckers 156 - Time: 3:30-4:40pm

Reception immediately following in the math library.

Abstract: In 2008, P. Diaconis and I.M. Isaacs introduced a generalization of classical character theory, which they called supercharacter theory. Let X be a partitioning of the irreducible characters of a finite group G such that the trivial character is in its own block of this partition. Let Y be a partitioning of the conjugacy classes of G such that identity element of G is in its own block of this partition. Define the supercharacters of G to be the sums of the irreducible characters in each block in X , weighted by their degree. Define the superclasses of G to be the unions of the elements in each block in Y . If the values of the supercharacters are constant on the superclasses, this is called a supercharacter theory of G . As a supercharacter is determined by these partitions, the structure of a group allows for multiple supercharacter theories. In this talk we will compare the construction of two different supercharacter theories, one based on the degrees of the irreducible characters of G and one based on the size of the conjugacy classes of G . In particular, we will demonstrate necessary and sufficient conditions that will force these two supercharacter theories to coincide when the groups considered are semidirect products of cyclic groups.