

1106-11-2325

John F. R. Duncan and **Sander Mack-Crane*** (mack-crane@case.edu). *The Moonshine Module for Conway's Group*.

Monstrous moonshine is a phenomenon that deeply links groups of isometries of the hyperbolic plane to the representation theory of the monster group, the largest sporadic simple group. Each element of the monster group is associated to a function on the hyperbolic plane which generates the field of functions invariant under a certain group of isometries (such a function is called a principal modulus for the group).

Frenkel–Lepowsky–Meurman illuminated this relationship by constructing a graded module for the monster group, whose graded trace by a monster element produces a principal modulus for the isometry group associated to that element of the monster.

Conway and Norton's monstrous moonshine paper also describes a moonshine phenomenon for Conway's group, the automorphism group of the Leech lattice. We construct the analog of the monster module for Conway's group, a graded module whose graded trace by a Conway element produces the principal modulus associated to that element by moonshine. This constitutes an important step toward a conceptual explanation for Conway moonshine. Our Conway module also finds application in physics, where we use it to compute twined elliptic genera of K3 sigma models. (Received September 16, 2014)